

Drivers of acquisition activity

Quantitative Methods of Economics and Management Science

Licentiate Thesis

Anna Lukkarinen

2011

Department of Information and Service Economy
Aalto University
School of Economics

Department of Information and Service Economy

Quantitative Methods of Economics and Management Science

Licentiate thesis

Author: Anna Lukkarinen	
Subject: Drivers of acquisition activity	
Number of pages: 99 + 3	Date: December 21, 2011
<p>Purpose of the study</p> <p>The purpose of this study is to establish an understanding of the various factors driving acquisition activity. The research problem is formulated as follows: <i>What drives acquisition activity?</i> Drivers of acquisition activity can be grouped into micro, industry, and macro level drivers depending on whether they affect individual companies, industries, or economies overall, respectively. The literature review encompasses drivers at all three levels in order to provide a comprehensive context. The empirical analysis focuses on assessing quantitative macro level drivers which are shown to explain the majority of aggregate acquisition activity.</p> <p>Data</p> <p>The empirical part of this study uses multiple linear regression to assess the quantitative macro level drivers of acquisition activity in Finland between 1992 and 2009. Data on the quarterly number of acquisitions made by Finnish companies is sourced from SDC Platinum. Data on the different macro level drivers is sourced from Datastream, Bank of Finland, Statistics Finland, and the Confederation of Finnish Industries.</p> <p>Results</p> <p>The results indicate that quantitative macro level drivers explain around 75% of the variability in aggregate acquisition activity. This study provides further insight into the time lags at which different drivers affect acquisition activity. Drivers that improve companies' financing ability precede high acquisition activity by four quarters. They are followed by drivers related to growing demand in the economy, which precede high acquisition activity by one quarter. Finally, high acquisition activity coincides with an overall positive sentiment in the economy. This study also finds that inflation, which has not been found as a driver in previous literature, has a significant positive relationship with acquisition activity, with no lag.</p>	
Supervisor and instructor: Professor Tomi Seppälä	
Keywords: Acquisitions, drivers of acquisition activity, mergers, multiple linear regression	Publishing language: English

TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	BACKGROUND	1
1.2	RESEARCH PROBLEM AND OBJECTIVES	2
1.3	DEFINITIONS OF MERGER, ACQUISITION, AND TAKEOVER	4
1.4	SCOPE OF THIS STUDY	6
1.5	STRUCTURE	9
2	LITERATURE REVIEW.....	11
2.1	OVERVIEW OF MERGERS AND ACQUISITIONS	11
2.2	HISTORICAL WAVES IN MERGER AND ACQUISITION ACTIVITY	15
2.3	DRIVERS OF MERGER AND ACQUISITION ACTIVITY	20
2.4	LITERATURE BASED FRAMEWORK AND HYPOTHESES	40
3	RESEARCH METHODOLOGY.....	44
3.1	SAMPLE OF TRANSACTION DATA	44
3.2	OPERATIONALIZATION OF VARIABLES	46
3.3	OPERATIONALIZED HYPOTHESES	53
3.4	STATISTICAL METHODS.....	55
4	EMPIRICAL ANALYSIS	59
4.1	DESCRIPTIVE ANALYSIS	59
4.2	REGRESSION ANALYSIS	68
4.3	LITERATURE BASED FRAMEWORK AUGMENTED WITH EMPIRICAL FINDINGS	82
5	DISCUSSION	86
5.1	CONCLUSIONS	86
5.2	ASSESSMENT OF RESULTS	90
5.3	SUGGESTIONS FOR FUTURE RESEARCH	94
	LITERATURE REFERENCES	95
	APPENDIX 1: NUMBER OF TRANSACTIONS IN EACH QUARTER.....	100
	APPENDIX 2: CHARTS OF VARIABLES PLOTTED OVER TIME	101

List of Figures

<i>Figure 1: Research problem, research questions, and the related objectives.....</i>	<i>3</i>
<i>Figure 2: Factors limiting the scope of this study.....</i>	<i>7</i>
<i>Figure 3: Structure of this study</i>	<i>9</i>
<i>Figure 4: Historical waves in acquisition activity</i>	<i>16</i>
<i>Figure 5: Factors contributing to buyers' acquisition decisions.....</i>	<i>21</i>
<i>Figure 6: Factors contributing to sellers' decisions to be acquired.....</i>	<i>26</i>
<i>Figure 7: Endgames curve of industry consolidation. Modified from Deans (2002).....</i>	<i>31</i>
<i>Figure 8: Literature based framework of the drivers of acquisition activity</i>	<i>41</i>
<i>Figure 9: Number of transactions announced each year.....</i>	<i>60</i>
<i>Figure 10: Number of announced transactions by quarter.....</i>	<i>61</i>
<i>Figure 11: Most common foreign target countries</i>	<i>63</i>
<i>Figure 12: Number of transactions announced each year in the nine most common target industries</i>	<i>65</i>
<i>Figure 13: Graphical illustration of Model 1</i>	<i>71</i>
<i>Figure 14: Graphical illustration of Model 2</i>	<i>71</i>
<i>Figure 15: Graphical illustration of Model 3</i>	<i>72</i>
<i>Figure 16: Plot of unstandardized residuals against time for Model 1.....</i>	<i>75</i>
<i>Figure 17: Plot of unstandardized residuals \hat{u}_t against \hat{u}_{t-1} for Model 2.....</i>	<i>75</i>
<i>Figure 18: Literature based framework augmented with empirical findings.....</i>	<i>83</i>
<i>Figure 19: Quantitative macro level drivers of acquisition activity</i>	<i>84</i>
<i>Figure 20: Synthesis of quantitative macro level drivers of acquisition activity</i>	<i>89</i>

List of Tables

<i>Table 1: Categorization dimensions of acquisitions</i>	12
<i>Table 2: Historical drivers of acquisition activity at industry level. Modified from Weston (2001); Sherman (2005); and Ahammad and Glaister (2008)</i>	28
<i>Table 3: Macro level drivers of acquisition activity</i>	32
<i>Table 4: Criteria used to define the data set</i>	45
<i>Table 5: Deal statuses included in the data set</i>	46
<i>Table 6: Summary of operationalizations and data sources</i>	53
<i>Table 7: Statistical properties of dependent and independent variables</i>	59
<i>Table 8: Number and share of transactions by relative nationality and currency of acquirer and target, transaction attitude, and acquired stake</i>	62
<i>Table 9: Number and share of transactions by industry, split according to target industry and acquirer industry</i>	64
<i>Table 10: Number and share of transactions for the most frequently occurring combinations of acquirer and target industries</i>	67
<i>Table 11: Results of regression analysis</i>	69
<i>Table 12: Test results for basic assumptions of linear regression</i>	74
<i>Table 13: Durbin-Watson test results for autocorrelation</i>	76
<i>Table 14: Variance inflation factors for assessment of multicollinearity</i>	77
<i>Table 15: Chow test results for parameter stability</i>	77
<i>Table 16: Results of Dickey-Fuller tests for stationarity</i>	79
<i>Table 17: Summary of operationalized hypotheses and results</i>	81

1 Introduction

1.1 Background

Researchers have focused on the reasons underlying companies' decisions to perform acquisitions for several decades. The dynamic patterns exhibited by acquisition activity have also received significant attention. Existing literature consistently mentions several drivers of acquisition activity, the most common of which include stock market conditions (e.g. Mitchell and Mulherin, 1996; Campa, 2006), credit market conditions (e.g. Weston, 2001; Sherman and Badillo, 2010), and the economic environment (e.g. Weston, 2001; Martynova and Renneboog, 2008).

Despite the vast attention given to the topic, results differ considerably by researcher, up to the point of contradiction. Ambiguity exists as to which drivers are significant, at what time lag acquisition activity reacts to each driver, and what the true direction of causality is. For example, literature investigating the relationship between stock market conditions and acquisition activity has yielded conflicting results. While some researchers have found no relationship between the two variables, others have observed bidirectional causality, and yet others have found a unidirectional relationship (Cook, 2007). Furthermore, each piece of existing research typically focuses on one or few main drivers of acquisition activity, using a sample data set usually representing one of the Western world's largest economies.

This study seeks to contribute to existing literature by 1) establishing a more comprehensive model of the drivers of acquisition activity, 2) decreasing publication bias by enlarging the pool of research available on the topic, and 3) presenting empirical results for a different country than is typically used. This contribution is achieved in three main ways.

Firstly, this study incorporates the key micro, industry, and macro level drivers of acquisition activity identified in existing research, while also adding a new driver. The empirical model created in this study seeks to provide a comprehensive view of the quantitative macro level drivers of acquisition activity, while also taking into account the time it takes for acquisition activity to react to changes in the macroeconomic environment. The empirical analysis focuses on quantitative macro level drivers

because, as will be shown, they explain the majority of the variability in aggregate acquisition activity in the sample data set.

Secondly, a larger pool of research is useful to decrease the overall effect of publication bias and to obtain increased clarity on the ambiguous results presented in research. Publication bias refers here to the phenomenon that a piece of research may be more likely to be published if it yields results desired by the researchers, such as significant relationships between variables, or a certain direction of causality. As existing literature contains mixed results about the relationship between certain variables and acquisition activity, more research is useful to better understand these relationships.

Thirdly, the data set used in the empirical part of this study focuses on Finland, hence providing a new dimension to existing research, which is generally based on the United States, the United Kingdom, or other large economies.

1.2 Research Problem and Objectives

This study evaluates factors that affect the level of companies' engagement in acquisition activity and the underlying reasons of these effects. Drivers of acquisition activity can be divided into three main categories based on the breadth of the set of companies that they affect. *Micro level drivers* are company specific reasons to engage in acquisitions. At micro level, acquisitions are motivated by managers and owners seeking operational, strategic, or financial improvements. *Industry level drivers* affect companies that operate in the same industry. They are triggered by fundamental changes affecting the industry. *Macro level drivers* are economy-wide and typically affect companies across industries.

The research problem is stated as follows: *What drives acquisition activity?* Dividing the research problem in accordance with the three different levels gives rise to three research questions. The first, and main, research question is further broken down into three sub-questions, as shown in Figure 1.

1. What drives acquisition activity at macro level?
 - 1a. What macro level factors affect acquisition activity?
 - 1b. How do these macro level factors affect acquisition activity?
 - 1c. Why do these macro level relationships exist?
2. Why does acquisition activity vary by industry?

3. Why do individual companies engage in acquisitions?

The objectives of the study are based on the three research questions, and are as follows:

- I. Develop a literature based framework that encompasses the drivers of acquisition activity at macro, industry, and micro level
- II. Develop an empirical model of macro level drivers of acquisition activity as a basis for the following:
 - i. Identify key macro level drivers of acquisition activity
 - ii. Quantify how these macro level drivers affect acquisition activity
 - iii. Explain why these macro level relationships exist

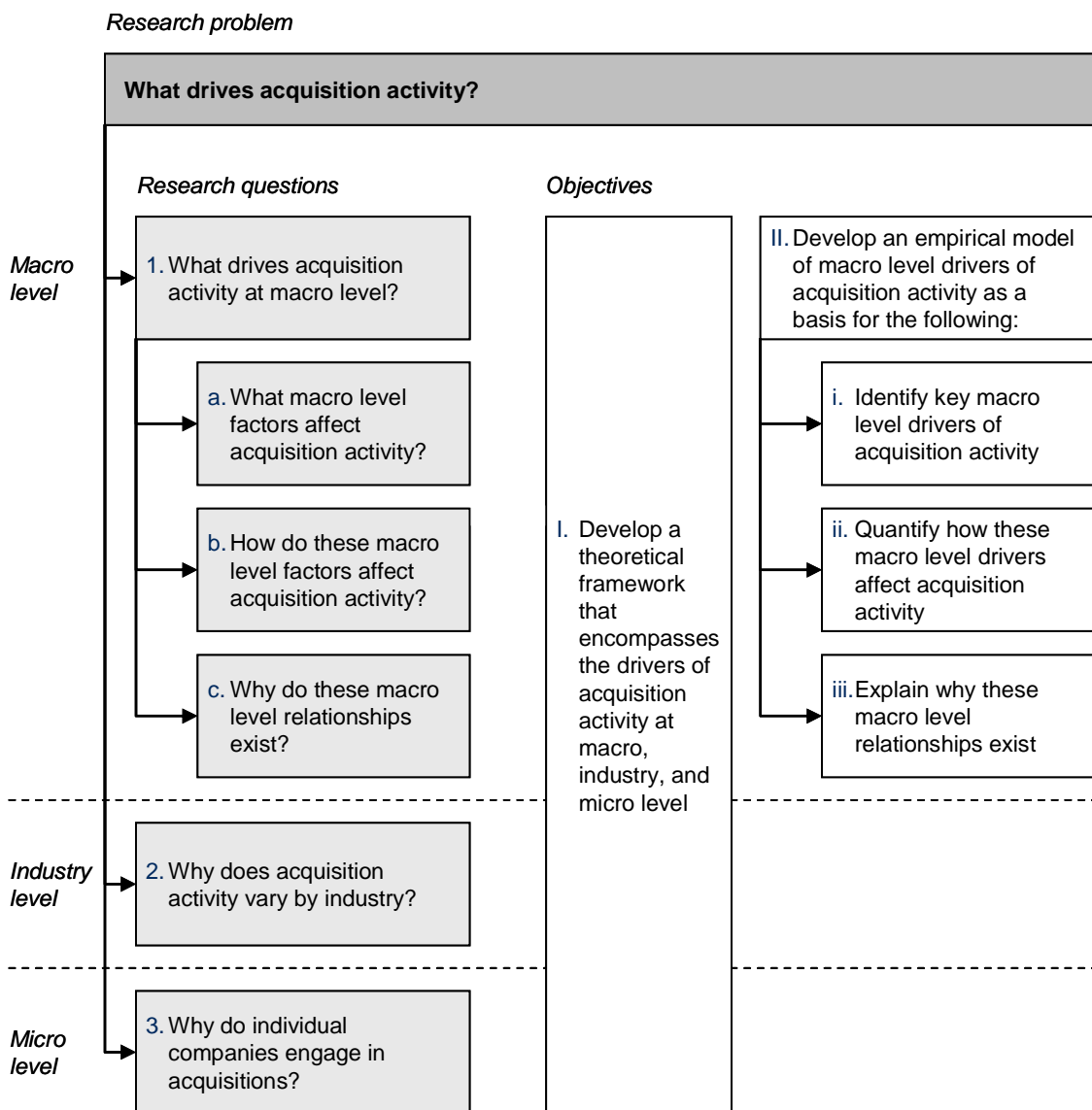


Figure 1: Research problem, research questions, and the related objectives

The literature review addresses all three research questions and the first research objective. The empirical part of this study focuses on the first research question and the corresponding second research objective; as will be shown with the results, quantitative macro level drivers explain the majority of variability in aggregate acquisition activity.

1.3 Definitions of Merger, Acquisition, and Takeover

The use of terms that refer to the action of combining the assets of two companies into a unified entity is diverse. Existing literature uses the terms *merger*, *acquisition*, and *takeover* in different and somewhat overlapping manners. This section presents definitions of the terms provided by researchers and concludes with the terminology used consistently throughout this study.

Merger

Hitt, Ireland and Hoskisson (2003) define *merger* as a “strategy through which two firms agree to integrate their operations on a relatively co-equal basis”. Sherman (2005) agrees with them, describing merger as the act of two or more companies joining together as peers. While he notes that technically the assets and liabilities of the selling company are absorbed by the buying firm, he emphasizes that a classic merger has no clear buyer or seller.

Epstein (2005) uses the term *merger of equals* to refer to such transactions which Sherman and Hitt, Ireland and Hoskisson call mergers: “Mergers of equals involve two entities of relatively comparable stature coming together and taking the best of each company to form a completely new organization.”

Gaughan (2005) and Ahern and Weston (2007) use the term merger in a broader sense. Gaughan describes merger as a combination of two companies where only one of them, the buyer, survives and the merged company, or target, typically ceases to exist. He mentions as a special case the act of combining relatively equally sized companies which results in the creation of an entirely new corporation. Gaughan notes that even if a transaction is reported as a merger between two companies, parties external to the transaction generally refer to the smaller company as the target and to the larger one as the buyer. Ahern and Weston (2007) provide the most generalized definition, stating

that a merger can be “any transaction that forms one economic unit from two or more previous units”.

Acquisition

Researchers who require the terms of a merger to be relatively co-equal for the two parties generally relax this requirement for the concept of an *acquisition*. Hitt, Ireland and Hoskisson (2003) define an acquisition as a “strategy through which one firm buys a controlling, or 100%, interest in another firm with the intent of making the acquired firm a subsidiary business within its portfolio”. They note that the acquired company’s management reports to the management of the acquirer.

Hitt, Ireland and Hoskisson limit the concept of an acquisition to refer to the purchase of a controlling interest, contradictory to several other researchers who also allow for the acquisition of a partial or remaining interest. Sherman (2005) represents the last-mentioned school, defining an acquisition as the “purchase of an asset such as a plant, a division, or even an entire company”. He states that the term acquisition can refer either to the purchase of assets or to the purchase of the seller’s shares. Epstein (2005) provides a general definition of an acquisition, describing it as the process of fitting a smaller company into the structure of a larger organization.

Takeover

A third term which arises often in the context of mergers and acquisitions is *takeover*.

Hanson (1974) defines a takeover as the event of one company buying all or a large portion of the shares of a target that it wishes to bring under its control. Several other researchers, however, add a dimension of hostility to the concept. Hitt, Ireland and Hoskisson (2003) define a takeover as a special type of acquisition where the acquirer’s bid has not been solicited by the target.

Comparison of the terms

As shown in the above paragraphs, the use of the terms merger, acquisition, and takeover is not uniform among the research community. Some researchers use acquisition as an umbrella term which encompasses special cases such as mergers or takeovers. Similarly, others use merger as the general term. Takeovers, however, are generally seen as a special case of either of the two, hence the most relevant comparison to be made is that between the terms merger and acquisition.

Brealey and Myers (2003) support the usage of merger as an umbrella term. They define merger as an “acquisition in which all assets and all liabilities are absorbed by the buyer”. In addition, they note that a merger can also be defined more generally as any combination of two companies.

Many researchers agree that mergers typically have a friendlier nature than acquisitions. Epstein (2005) points out that mergers of equals can create power struggles as both companies seek to gain control of the new entity. This problem occurs more rarely in acquisitions where it is clear which company is in charge. Sherman (2005) adds that the culture and spirit of the negotiations are more cooperative in mergers than in acquisitions. Unlike in many acquisitions, data gathering and due diligence related to mergers are typically two-way and mutual.

This study focuses on all mergers, acquisitions, and takeovers, regardless of the term used by transaction parties or other stakeholders. The detailed semantics of corporate transaction terminology are therefore not essential here. Consequently, unless otherwise implied by the specific context, the terms merger and acquisition are used interchangeably in this study.

This choice of terminology is in accordance with many researchers. Lynch and Lind (2002) define merger and acquisition to be synonymous for the purposes of their article. According to Sherman (2005), the distinction between a merger and an acquisition may not necessarily matter. He remarks that both transaction types lead to the same end result: two companies which used to have separate ownership eventually operating under the same roof. Ahern and Weston (2007) use the same definition for both merger and acquisition. They define both as the purchase of an entire firm or specific assets by another firm, leading to a new combination of existing assets.

In order to avoid confusion, acquisition will be used as the prevalent term in this study because of the rarity of transactions where the two parties would truly be relatively equal. As stated by Hitt, Ireland and Hoskisson (2003), true mergers are uncommon because one party is usually dominant.

1.4 Scope of This Study

The scope of this study is defined along six different dimensions which relate to location, time, phases of the acquisition process, transaction type, transaction status, and

the drivers of acquisition activity. These dimensions are summarized in Figure 2 and further described in this section.

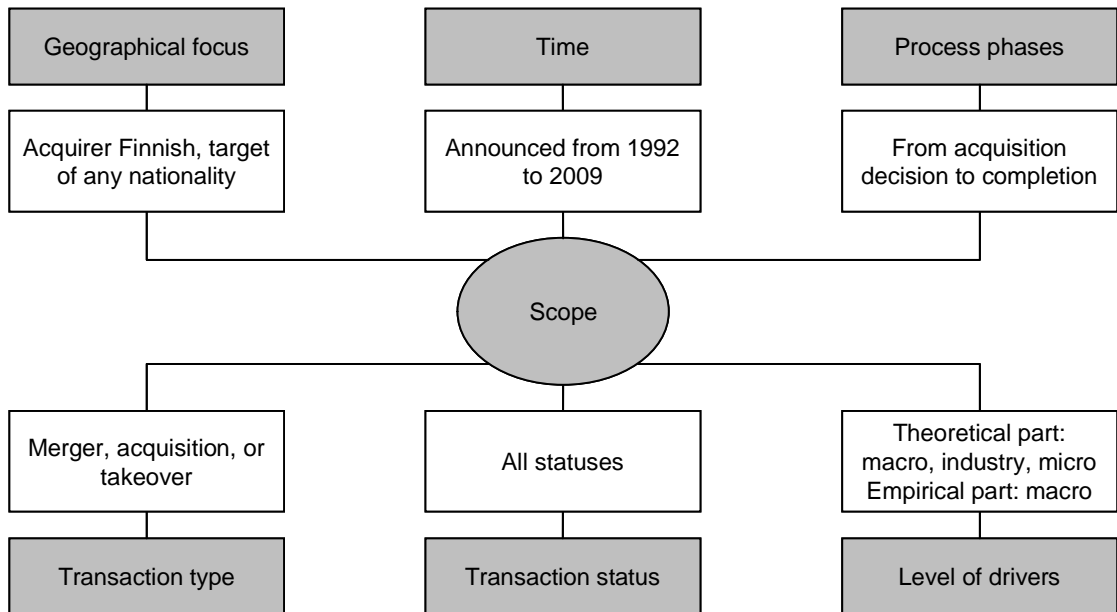


Figure 2: Factors limiting the scope of this study

The geographical focus of this study is global for the literature review, and limited to Finland for the empirical analysis. The geographical scope of existing research has not been used as a criterion when selecting literature references. However, the literature review does not include research with a very limited geographical focus containing results which are not likely to be generalizable to other regions. The empirical part of this study is limited to transactions where the acquirer is Finnish, whereas the target can be of any nationality. The main reason for limiting the acquirer's nationality rather than the target's is that acquisition activity is more likely to be influenced by the environment and capabilities of the acquirer. Allowing the target to be of any nationality also allows for a larger data set.

No time restrictions have been set on the research used in the literature review. The earliest and most recent references are from 1959 and 2010, respectively. The time scope of the empirical part allows for transactions announced between 1992 and 2009, including the boundary years.

An acquisition is a multi-phased process with no clear beginning or end. While the process can be thought to start with an initial idea to buy or sell, the actual need for a

transaction may have emerged much earlier. Similarly, the process does not end with the completion of the transaction. Post-transaction integration can take a long time, and the acquisition process can even be thought to go on for as long as the transaction parties continue to operate together. This study focuses on a specific part of the transaction process, beginning with the acquirer's decision to buy a target and ending with the completion of the transaction. While the scope of interest theoretically begins with the buyer's initial decision to make an acquisition, this is in practice replaced by the announcement date due to earlier dates not being publicly available. Although this study does not assess the actions or performance of the combined entity after the completion of the transaction, the financial effects of acquisitions are qualitatively touched upon in the literature review.

As discussed in Section 1.3, mergers and acquisitions can be defined in a variety of manners. This study focuses on all transactions which are called mergers, acquisitions, or takeovers by the research community. The empirical part includes all such corporate transactions, as recorded by the SDC Platinum database. The target can be an entire company, a majority or minority stake of a company, an asset or group of assets, or a business unit. The buyer can be any company, industrial or financial, or even an individual investor.

The research used in the literature review has diverse approaches to allowable transaction status. The majority of the reference articles where deal status is relevant include all announced transactions, regardless of whether they have been completed, terminated, or are still pending. The aim of this study is to analyze factors that affect companies' levels of engagement in acquisition activity. The intent or attempt to acquire a company does not always lead to completion. Hence, the data set of this study contains all transactions that have been announced or are otherwise known to be planned, regardless of whether they have been completed.

The drivers of acquisition activity can be company specific, industry specific, or economy-wide. All three levels of drivers are introduced in the literature review in order to provide a comprehensive context. The empirical part of this study builds quantitative models focusing on economy-wide drivers, hence limiting the scope to such factors which influence a large amount of companies at the same time. As will be shown by the results, the quantitative models nevertheless explain the majority of the variability in acquisition activity. While company specific factors are clearly important when

considering individual acquisitions, they become less relevant when looking at aggregate acquisition activity.

1.5 Structure

This study consists of four main parts: introduction, literature review, empirical research, and discussion of the results. The structure of the study is presented in Figure 3.

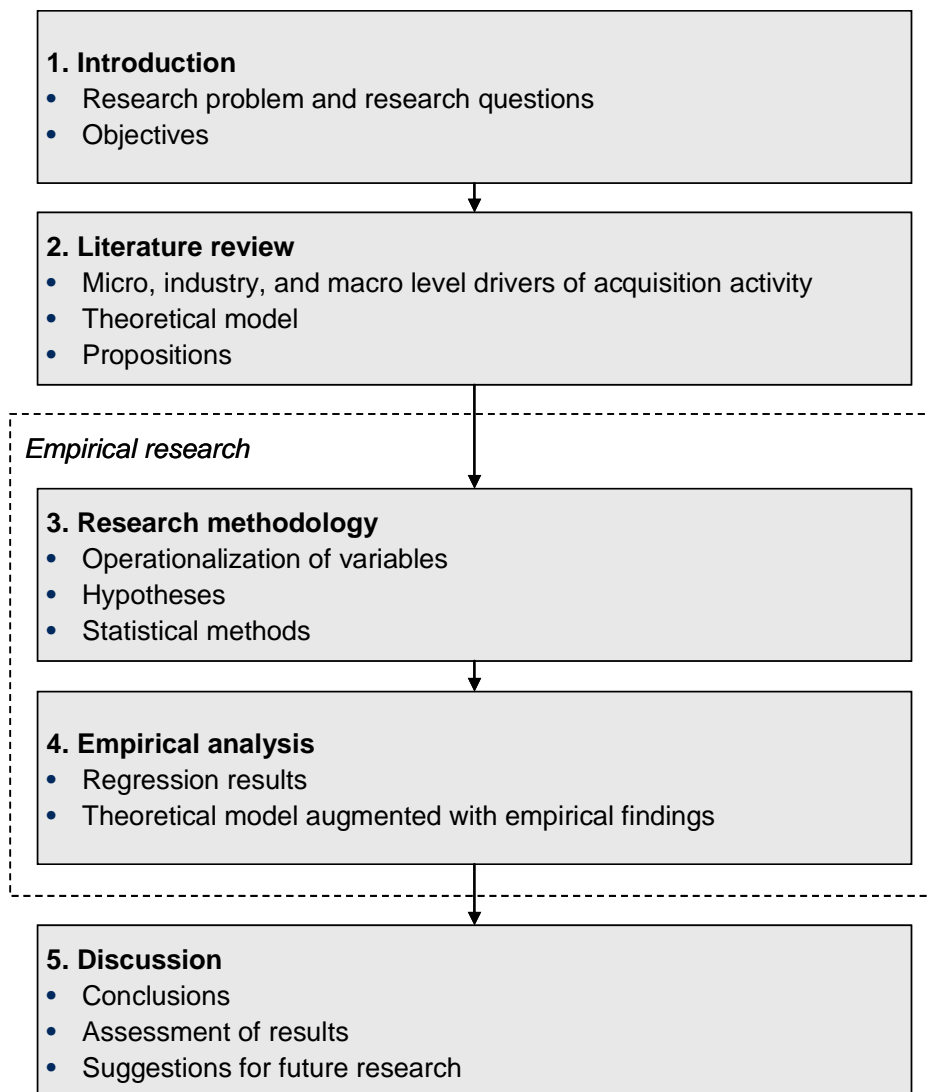


Figure 3: Structure of this study

The study begins with an introductory chapter which presents the background of the study and introduces the research problem, questions and objectives. Chapter 1 also

presents key definitions and establishes the scope of the study. Chapter 2 approaches the research questions through a literature review that presents micro, industry, and macro level drivers of acquisition activity. The chapter finishes with a literature based framework which encompasses all key drivers of acquisition activity identified in the literature review, and with hypotheses arising from the literature based framework.

The empirical part of this study consists of a description of the research methodology and of the empirical analysis. Chapter 3 presents the research methodology, beginning with a description of the data sample. It then develops operationalizations of the variables identified in the literature review, and combines them with the hypotheses from Chapter 2 to develop operationalized hypotheses. Chapter 3 concludes with introducing the statistical methods used in the empirical analysis. Chapter 4 presents the results of the empirical analysis and assesses the adequacy of the regression models developed. It concludes by placing the empirical findings into the context of the literature based framework.

Lastly, Chapter 5 presents the conclusions from the study along with an assessment of the results. The chapter finishes by providing suggestions for future research.

2 Literature Review

The research problem calls for an understanding of the drivers of acquisition activity. This chapter assesses the research problem through findings from existing literature. Section 2.1 provides an overview of mergers and acquisitions. Section 2.2 describes historical waves exhibited by acquisition activity. Section 2.3 proceeds to describing and justifying the drivers of acquisition activity at micro, industry, and macro levels. Each of its three sub-sections corresponds to one of the three research questions. Finally, Section 2.4 presents a literature based framework of the drivers of acquisition activity as well as related hypotheses, developed based on findings from literature.

2.1 Overview of Mergers and Acquisitions

This section provides an overview of mergers and acquisitions. After a brief introduction to the reasons underlying acquisition activity, Section 2.1.1 presents the most common dimensions along which acquisitions can be categorized. Section 2.1.2 describes the ongoing debate among the research community about the benefits and disadvantages of acquisitions.

Companies that wish to grow have three general options for achieving growth. They can grow *organically*, *inorganically*, or *externally* through such arrangements as joint ventures or alliances (Sherman, 2005). This study focuses on inorganic growth obtained through acquisitions.

Many researchers agree on the economic importance of acquisitions. Sherman (2005) states that mergers and acquisitions are a crucial part of the mechanics of a healthy economy and that they affect a wide variety of industries. Deans (2002) makes two strong suggestions which heavily support the use of acquisition strategies. First, he suggests that companies need to grow constantly in order to survive. Second, he opines that organic growth does not lead to success and that companies must engage in acquisition activities if they are to outgrow their competitors. According to Hitt, Harrison and Ireland (2001), acquisitions are an essential, possibly even dominant, strategy for companies in the 21st century.

It should be noted that while the base of acquirer and target companies is highly diverse, a significant portion of acquisitions are made by companies that Gardiner (2006) calls

serial acquirers. These are large firms for which acquisition activities are an ongoing part of daily business.

2.1.1 Categorization

Mergers and acquisitions can be categorized based on the transaction parties' business relationship, nationality, and attitude towards the transaction. These features are summarized in Table 1, which shows different transaction types along the three dimensions.

Table 1: Categorization dimensions of acquisitions

Dimension	Transaction alternatives
Business relationship	Horizontal Vertical Related Conglomerate
Nationality	Domestic Cross-border
Attitude towards transaction	Friendly Hostile

Acquisitions can be classified in terms of the type of business relationship between the transaction parties. *Horizontal* acquisitions are deals which take place between direct competitors (Melicher, Ledolter and D'Antonio, 1983; Gaughan, 2005). *Vertical* transactions are combinations of companies which hold different places in the same value chain and hence operate at different stages of production (Melicher, Ledolter and D'Antonio, 1983). The parties of a vertical transaction have buyer and seller relationships with each other. Frequently occurring types of vertical transactions include the acquisition of a supplier and the acquisition of a company which is closer in the distribution chain to the end customer. *Related* acquisitions take place between firms in closely related yet different industries (Gaughan, 2005). Finally, *conglomerate* deals are transactions between large companies which do not have any direct business relationship with each other and do not seek significant synergies from combining their businesses (Epstein, 2005).

The second type of categorization is based on the nationalities of the transaction parties. *Domestic* transactions occur between companies of the same nationality. Transactions in which a company headquartered in one country is acquired by a firm headquartered in another country are *cross-border* transactions (Hitt, Ireland and Hoskisson, 2003).

Transactions can also be categorized based on the parties' attitudes towards the acquisition. Most acquisitions are *friendly* transactions where the two parties negotiate the terms of the deal. However, acquisitions can also be *hostile* processes where the transaction is not desired by the target's management (Hitt, Ireland and Hoskisson, 2003). Andrade, Mitchell and Stafford (2001) define a bid as hostile if the target company publicly rejects it, or if the acquirer describes it as unsolicited. In hostile takeovers bidders seek acceptance directly from the target company's shareholders, often against management's recommendations. Schwert (2000) suggests that while friendly transactions often lead to gains from strategic synergies, hostile transactions can create gains from the replacement of the target's incumbent managers.

2.1.2 Financial Effects

Despite the stated economic importance of acquisition activities, undertaking acquisitions is not risk-free (Hitt, Harrison and Ireland, 2001). Widespread debate exists among the research community about whether acquisitions are fundamentally beneficial or harmful to the acquirer's profitability (Mueller, 1989).

Many researchers point out that a large portion of acquisitions fail (e.g. Daniel, 2001; Hitt, Ireland and Hoskisson, 2003). Transaction failure can be defined as the inability to create value for shareholders (Sherman, 2005).

While the shareholders of acquired firms often benefit financially from an acquisition, the shareholders of the acquirer are more likely to suffer from a negative share price development (Hitt, Harrison and Ireland, 2001). When a transaction is incorrectly valued, one party gains at the expense of the other. Successful transactions should be valued so that they reflect the economic needs of both the buyer and the seller, however, in practice the seller's needs are often not accounted for appropriately (Sherman, 2005; Malmendier and Tate, 2008).

Daniel (2001) suggests that several transactions are value destructive and that the acquirer's post-transaction performance is often noticeably lower than its pre-transaction performance. In the majority of acquisitions made by public companies, the

share price of the acquirer falls immediately after the announcement of the transaction. This may reflect investors' skepticism about the acquisition (Hitt, Ireland and Hoskisson, 2003).

The implementation of acquisitions has several potential pitfalls which can lead to an unsatisfactory outcome. First, the transaction parties may force a deal which should not be done in the first place. Second, mistakes and crucial omissions can be made during the due diligence process. Third, the timetable to closing the transaction may be too aggressive. Fourth, integrating the businesses of the transaction parties can turn out to be overly difficult (Sherman, 2005).

Lynch and Lind (2002) divide the most common reasons for transaction failure into two groups, those due to mistakes in the pre-transaction planning process, and those caused by mistakes in post-transaction integration. Pre-transaction errors include insufficient due diligence, inadequate strategic motives, and overly optimistic synergy expectations. Post-transaction mistakes include too slow an integration process, conflicting corporate cultures, and a lacking risk management plan.

Hitt, Harrison and Ireland (2001) accentuate one of the points mentioned by Lynch and Lind (2002) and by Sherman (2005). They note that the integration of two companies with different cultures and operational structures can be an unexpectedly challenging task. They add that integration can be particularly difficult in hostile takeovers, as negative feelings may have emerged among the managers and employees of the two firms.

Some researchers find that acquisition activity at large can have an innovation reducing effect, although access to new innovations is often seen as an incentive for companies to perform acquisitions. Hitt, Harrison and Ireland (2001) suggest that companies performing several acquisitions over time tend to become more risk averse and increasingly emphasize financial controls. Consequently, the rate at which they introduce new products to the market may decrease. This, in turn, leads to the companies making further acquisitions in order to gain hold of new innovations. As a whole, this can become an innovation diluting cycle. Jensen's (1988) findings, however, do not support the suggestion of Hitt, Harrison and Ireland. He states that he has found no evidence supporting the argument that acquisitions would reduce investments in research and development.

Several researchers suggest that while the financial consequences of an acquisition may not be attractive when considered in isolation, the acquisition may still be the optimal course of action when compared to all other viable options. Mueller (1989) highlights the possibility that managers may not always even expect acquisitions to be successful. They may engage in acquisition activities for other reasons, such as in order to spread risk.

Acquisition activity can occur as a result of unexpected changes in an industry, as will be discussed in Section 2.3.2. When acquisition activity picks up as a result of a negative change in an industry, it is not surprising that the post-acquisition performance of many companies is unsatisfactory. In such instances it is possible that performance declines are not caused by acquisitions, but by the underlying industry changes. It is possible that an even larger number of business failures would occur in periods of fundamental industry changes if acquisition activity was inhibited (Mitchell and Mulherin, 1996).

Gardiner (2006) encapsulates Mitchell and Mulherin's logic by concluding that even if a transaction results in a loss of value, shareholders may be willing to tolerate it because the alternative course of action of not undertaking the acquisition might lead to an even greater loss. He finds it likely that the acquisition waves of the 1980s and 1990s contributed to improvements in corporate profitability.

Harford (2005) notes that while prior performance is an adequate measure of an acquisition's success outside an acquisition wave, it can rarely be used as a performance measure during a wave because companies are responding to an underlying industry shock.

2.2 Historical Waves in Merger and Acquisition Activity

The level of acquisition activity does not remain constant over time. Rather, acquisition volumes have historically formed distinct waves, with a lot of transactions taking place at peak periods and relatively few transactions occurring during troughs. Golbe and White (1993) confirm, through econometric testing, the empirical observation that acquisition activity exhibits a wave pattern.

Global acquisition activity exhibited five distinct waves during the 20th century (Hitt, Ireland and Hoskisson, 2003). The five waves of the 20th century, as well as acquisition

activity in the 2000s, are presented in Figure 4. The following sections describe the characteristics of each wave.

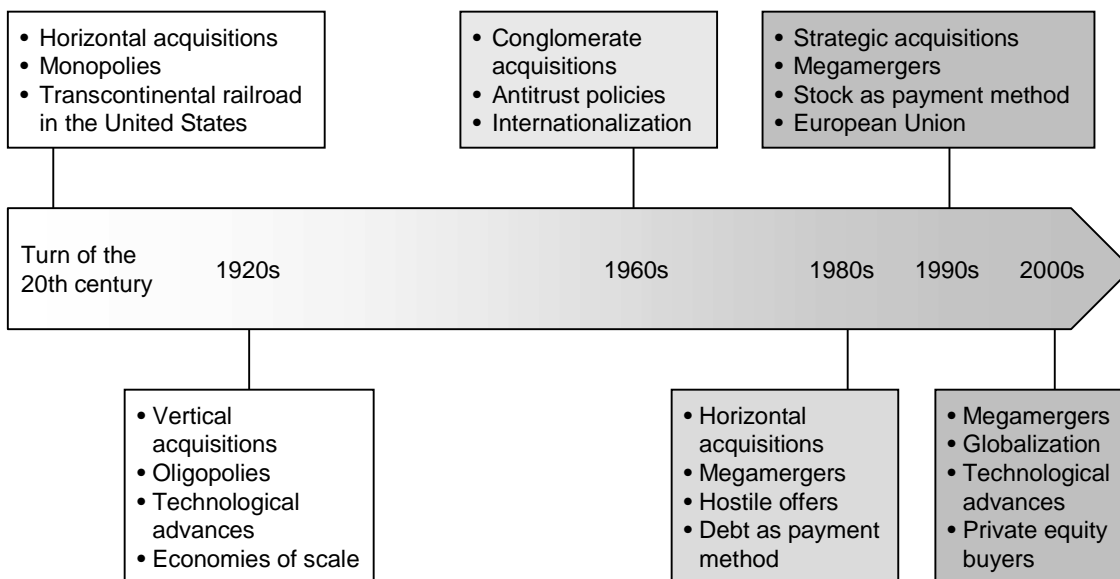


Figure 4: Historical waves in acquisition activity

While the waves in Europe differed somewhat from those in the United States, the underlying characteristics were broadly the same in both regions (Martínez Torre-Enciso and Bilbao García, 1996). The early waves occurred in Europe in a smaller scale than in the United States, whereas the fifth wave was a fully international phenomenon (Martynova and Renneboog, 2008). Because acquisitions were more common in the United States than elsewhere prior to the 1990s (Gaughan, 2005), the historical description of this section is inclined towards a United States perspective.

2.2.1 Turn of the 20th Century

The turn of the 20th century exhibited mainly horizontal acquisitions (Gaughan, 2005). While the opponents of acquisition activity feared excessive monopolization, its proponents were attracted by the efficiency advantages of horizontal integration (Mueller, 1989). In the late 19th century, many industries were very fragmented. At the end of the acquisition wave, several industries had become more concentrated, with near monopoly players dominating in many industries (Gaughan, 2005).

The first wave of the 20th century was geographically strongest in the United States and in the United Kingdom (Mueller, 1989). In the United States, the completion of the first

transcontinental railroad system created a common market and contributed to the emergence of the first acquisition wave (Weston, 2001).

2.2.2 1920s

While the wave of the turn of the century was known for the formation of monopolies, the second wave was characterized by the emergence of oligopolies (Mitchell and Mulherin, 1996; Gaughan, 2005). Although many horizontal deals were still performed in the 1920s (Gaughan, 2005), there was a considerable increase in vertical transactions (Weston, 2001).

Technological advances functioned as a catalyst for the increase in acquisition activity in the 1920s. As a result of general technological developments, it became possible for companies to achieve economies of scale by strongly increasing the levels of production. Acquisitions were a rapid way to achieve this growth (Martínez Torre-Enciso and Bilbao García, 1996).

The wave of the 1920s ended with the collapse of the stock markets in 1929 and the deep recession that followed (Gaughan, 2005).

2.2.3 1960s

The next major period of acquisition activity after the 1920s did not occur until the 1960s (Gaughan, 2005). With the internationalization of the economy, it became a common belief that companies needed to be large in order to remain competitive in the increasingly international business environment (Martínez Torre-Enciso and Bilbao García, 1996).

The 1960s are known as the period of conglomerate deals (Mitchell and Mulherin, 1996). In the United States, antitrust laws were aimed at hindering acquisitions that might increase companies' market power through integration (Hitt, Ireland and Hoskisson, 2003). Such antitrust policies made it more difficult for companies to implement horizontal or vertical transactions. As firms nonetheless wished to perform acquisitions in order to grow, they acquired companies with which they did not have direct business relationships (Gaughan, 2005). Underlying the conglomerate acquisition activity was a belief that a good manager could manage any company, regardless of the industry (Weston, 2001).

2.2.4 1980s

The 1980s are often referred to as the decade of merger mania (Hitt, Harrison and Ireland, 2001). The acquisition wave of the 1980s featured several transactions exceeding one billion dollars in value. Such deals are often called *megamergers* (Gaughan, 2005). The 1980s continued a trend, begun in the 1970s, of an increasing amount of acquisitions where both parties operate in the same industry (Andrade, Mitchell and Stafford, 2001).

The fourth wave exhibited a large amount of hostile offers for large companies (Gaughan, 2005). Although the 1980s are referred to by many as the period of hostile takeovers, it should be noted that such transactions were still a minority of all transactions (Andrade, Mitchell and Stafford, 2001). In the U.S., target management contested 20-40% of offers made during the 1980s (Holmström and Kaplan, 2001).

Debt became a popular means of financing in the 1980s (Hitt, Harrison and Ireland, 2001). The use of high yield non-investment-grade bonds became popular in the 1980s. This new financing technique enabled relatively small firms to obtain resources required to acquire much larger companies (Jensen, 1988). This created an environment where almost any company could be taken over (Weston, 2001).

The fourth wave ended with the deceleration of the economy at the end of the 1980s (Gaughan, 2005).

2.2.5 1990s

The last wave of the 20th century took place in the 1990s. The decade continued the era of megamergers, featuring transactions larger than had ever been seen before (Gaughan, 2005). The 1990s also exhibited a larger proportion of strategic transactions than the previous decades (Weston, 2001; Gaughan, 2005).

The two key characteristics of the previous wave, hostility and leverage, declined considerably during the 1990s. Holmström and Kaplan (2001) argue that the mindset shift towards amiability was caused by management incentives being better aligned with those of shareholders, and targets therefore being more often voluntarily willing to be acquired. As the use of leverage decreased, stock was increasingly used as a payment method (Andrade, Mitchell and Stafford, 2001; Hitt, Harrison and Ireland, 2001). Holmström and Kaplan (2001) rationalize that acquisitions were increasingly seen as a

means to reconfigure companies to grasp technological and geographical growth opportunities, to which purpose equity was better suited as a payment method.

Many expected there to be a clear increase in acquisition activity in Europe in the early 1990s because of the European Union and the development towards a single market. This increase was, however, somewhat mitigated by the European recession of the early 1990s (Martínez Torre-Enciso and Bilbao García, 1996). By the end of the 1990s, European acquisition activity had reached the level experienced in the United States. Activity also began to increase in Asia (Martynova and Renneboog, 2008).

The wave of the 1990s ended abruptly with the burst of the technology bubble at the turn of the 21st century and the consequent global recession (Sherman, 2005).

2.2.6 2000s

Moving into the 21st century, acquisition activity picked up again around 2004 (Sherman, 2005; Campa, 2006; Scherer, 2006) and remained strong for three years. Worldwide acquisition activity reached an all-time high in terms of value in 2007 (Moschieri and Campa, 2009). The high levels of activity of the mid-2000s reflected the global recovery of the financial markets after the downturn of the beginning of the decade. Other reasons for the pickup in activity included technological developments and globalization (Campa, 2006). Many transactions were motivated by companies' willingness to achieve top-line growth as they were no longer able to increase profitability through further cost reductions. The 2000s continued the era of megadeals which had started in the 1980s (Sherman, 2005).

2007 was the first year when European acquisition activity exceeded that of the United States, which has historically been the dominant market for acquisitions. The increase in European activity was driven by standardization actions of the European Commission, as well as economic integration in Europe. The wave of the 2000s was also characterized by an increased number of cross-border transactions, both in Europe and globally (Moschieri and Campa, 2009).

Private equity players have been active in acquisitions since the 1980s. However, the number and size of private equity investments increased considerably in the 2000s (Martin and Schrum, 2007). Also, large private equity houses began to compete collectively for large targets by forming consortia (Sherman, 2005).

Starting in the latter half of 2007, the global credit crisis led to a heavy deceleration in transaction volumes (Granahan, 2008). The slow pace of acquisition activity continued for a few years, with first signs of a gradual re-emergence of the market for mergers and acquisitions becoming visible in early 2010 (Sherman and Badillo, 2010).

2.3 Drivers of Merger and Acquisition Activity

The factors that influence acquisition activity can be divided into three main groups based on the extent of their domain. *Micro level drivers* are company specific. They arise from the operational, strategic, financial, or managerial needs of specific companies. *Industry level drivers* affect only certain industries at a given point in time. They can arise inter alia from changes in government policy concerning certain industries, or as a result of technological innovations in an industry. *Macro level drivers* are macroeconomic factors whose influence is spread across industries.

2.3.1 Micro Level Drivers

Company specific drivers of acquisition activity can be divided into two groups based on whether they function as incentives for the potential buyer to acquire or for the potential target to sell. This section describes micro level drivers first from a buyer's, then from a seller's perspective.

Buyer perspective

Figure 5 displays the most commonly stated factors contributing to buyers' decisions to engage in acquisitions. The factors are categorized into six main groups: operational strength, growth and expansion, access to new assets, competitive strength, financial objectives, and management issues. Each of the six groups is further discussed below.

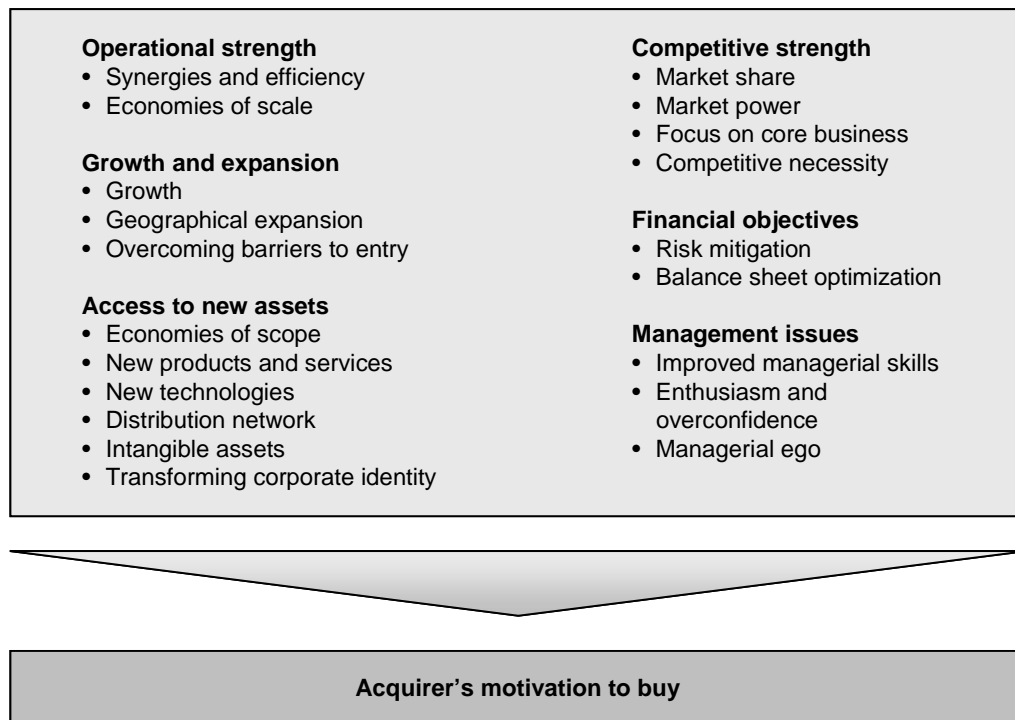


Figure 5: Factors contributing to buyers' acquisition decisions

The first group consists of factors related to *operational strength*. Broadly defined, the underlying reason for most buyers to engage in an acquisition is the objective of reaching *synergies* by making the whole “greater than the sum of its parts” (Sherman, 2005). Synergies most commonly result from cost reductions, as the integration of two companies enables the elimination of duplicate costs (Gardiner, 2006). These cost reductions lead to improved *efficiency* (Daniel, 2001; Clougherty, 2006). Efficiency can also be increased through better utilization of previously underutilized resources (Sherman, 2005). In their study of Finnish and Swedish companies, Häkkinen, Norrman, Hilmola and Ojala (2004) find that synergy realization is often found not to be overly difficult, however the level of difficulty varies by function, with sales, research and development, as well as logistics typically being the most challenging.

If the transaction parties operate in the same market, integration can create *economies of scale* (Hitt, Ireland and Hoskisson, 2003). Economies of scale arise when the output generated by the combined entity is higher than the sum of the outputs when the two companies operate individually (Lambrecht, 2004).

The second group relates to *growth and expansion*. When a company is seeking *growth*, it is generally faster to buy other companies or assets than to build a business

organically (Gaughan, 2005). It can be faster to increase sales and profits through external purchases than by building additional volume from scratch (Sherman, 2005).

The pressure to rapidly adapt to changes is high in turbulent economic environments. Acquisitions often enable companies to better adjust to quick changes than organic growth (Ahern and Weston, 2007). Few companies have the time or the expertise required to grow fully organically while simultaneously keeping up with the competition and the pace of change of the industry (Daniel, 2001).

Acquisitions can allow buyers to quickly establish a critical mass of production facilities or other resources required to compete successfully (OECD, 2001). They can also provide first-mover advantages by allowing acquirers to achieve critical mass before their rivals, or to gain hold of better contracts than their competitors (Ahern and Weston, 2007; Firstbrook, 2007). Furthermore, shareholders' appetite for constant growth and dividends can induce companies to perform acquisitions (Sherman, 2005).

Acquisitions can be used as a means for *geographical expansion* (Daniel, 2001). The need to expand to new countries may be created by the increasingly international presence of client companies (Ahern and Weston, 2007). The saturation of a company's existing geographical markets can also be an incentive to diversify through cross-border acquisitions (Sherman, 2005). Acquisitions can be a fast and relatively straightforward manner of gaining a presence in new markets. Starting afresh in an overseas market is often considered riskier than buying a ready-made entry (Ahammad and Glaister, 2008). Many companies use acquisitions to *overcome barriers to entry* to a new market (Sherman, 2005). The higher the entry barriers, the higher the probability that a company will use an acquisition strategy to overcome them. Barriers are often steep especially when firms attempt to enter international markets. Cross-border acquisitions are a common strategy used to overcome such barriers (Hitt, Ireland and Hoskisson, 2003).

The third group contains drivers through which acquirers seek *access to new assets*. *Economies of scope* result from cost reductions when activities in related businesses are combined into one company (Weston, 2001). In several industries, end customers have increasingly begun to favor companies which are able to provide a complete product line, because this facilitates the customer's buying process (Sherman, 2005). The requirement for one-stop shopping can function as an incentive for companies to enhance their capabilities through acquisitions (Ahern and Weston, 2007).

Acquisitions can be used as a means to introduce *new products and services* to the market (Sherman, 2005). It can be difficult to earn profitable returns by developing products internally and bringing them to the market sufficiently quickly (Hitt, Ireland and Hoskisson, 2003). Alternatively, a company's previous attempts to generate innovations through internal research and development may have been unsuccessful, which can create a strong incentive to acquire (Lynch and Lind, 2002).

In addition to new products and services, companies can gain hold of *new technologies* or exploit complementary technological capabilities via acquisitions (Daniel, 2001; Hitt, Ireland and Hoskisson, 2003). The unwillingness or inability to develop a technology in-house can result from either time or resource constraints. A new technology can be acquired in two manners. The target company may already have developed the technology, in which case the acquirer directly gains hold of the technology with the acquisition. Alternatively, the target company may possess the knowledge and talent necessary to develop the technology (Ahammad and Glaister, 2008).

These views are supported by the findings of Lehto and Lehtoranta (2002), which show that companies that invest more in research and development are more likely to be acquired. In a subsequent study, Lehto and Lehtoranta (2006) find that possession of innovations increases a company's probability of being acquired, however this result does not hold for processing industries which typically require heavy upfront investments. In line with the findings of Lehto and Lehtoranta, in their study of the effect of patenting on acquisitions, Ali-Yrkkö, Hyytinen and Pajarinen (2005) show that patenting increases the probability of a Finnish company being acquired by a foreign firm. In a later study, Ali-Yrkkö (2006) finds that the quality of patents does not affect the probability of being acquired.

An acquisition can enable a company to effectively increase the reach of its *distribution network* (Sherman, 2005). Instantaneous access to new distribution channels can thus make acquisitions an attractive expansion strategy (Firstbrook, 2007).

The underlying reason for many acquisitions in the 2000s has been to acquire the target company's human and intellectual capital (Daniel, 2001; Sherman, 2005). If a company's competitiveness is impeded by insufficient *intangible assets*, it can acquire another company to gain hold of such assets (Ahammad and Glaister, 2008). Ahern and Weston (2007) note that the greater a potential target's intangible resources, the more

likely other companies are to acquire it instead of using other forms of collaboration, such as alliances.

Acquisitions can also be used as a means to *transform corporate identity*. Companies can renew their public image by buying and adopting the brand of another company. Many acquirers find that it is more expensive to build brand loyalty than to buy a brand which already has an established base of loyal customers (Sherman, 2005).

The fourth group consists of drivers through which companies seek to increase their *competitive strength*. Acquisitions provide a rapid way to increase *market share*. Organic growth can sometimes take too long for a company to be able to improve its market share (Lynch and Lind, 2002). A horizontal acquisition increases the acquirer's market share and reduces the number of competitors in its competitive landscape (Sherman, 2005).

Horizontal acquisitions can lead to increased *market power* through cost- and revenue-based synergies. Market power exists when a company is able to sell its products at higher prices than its competitors, or when it can produce at lower costs than its competitors (Hitt, Ireland and Hoskisson, 2003). Market power also increases a company's ability to raise prices through reduced competition (Clougherty, 2006). Increased financial and market power can enable the merged entity to better compete against the market leader (Hitt, Ireland and Hoskisson, 2003). Acquisitions can also lead to enhanced bargaining power with suppliers and customers (Gardiner, 2006).

Competitive pressures have increasingly forced companies to focus on their *core business*. Divestitures and acquisitions often reflect companies' efforts to get rid of non-core operations and to acquire businesses that enhance their core competencies (Ahammad and Glaister, 2008). Furthermore, if undesirable changes emerge in a company's primary markets, it can attempt to shift its core business by performing acquisitions in different markets (Hitt, Ireland and Hoskisson, 2003).

Sometimes companies can be led to perform acquisitions out of *competitive necessity*. If a company is announced to be for sale, all potential buyers realize that if they do not acquire the company, one of their competitors might do so and gain a competitive edge. Acquisitions can thus be used as a vehicle to pre-empt acquisitions by competitors (Ahern and Weston, 2007).

The fifth group consists of *financial objectives*. Sometimes acquisitions are used as a tool to *mitigate risks*. Diversification through acquisitions can be used as a hedge

against cash flow fluctuations in a certain business line (Sherman, 2005). The acquisition of companies in other countries spreads risks, because the covariance of industry returns in several economies is usually smaller than within one economy (Ahammad and Glaister, 2008). Another financial incentive for acquisitions is *balance sheet optimization*, as acquisitions can be used to increase the debt component of under-leveraged balance sheets (Gardiner, 2006).

The sixth and final group encompasses drivers caused by *management issues*. When small companies grow, their need for more extensive *managerial skills* typically increases. Large companies with deep layers of managerial skills may be incentivized to acquire small companies and provide them with an adequate management structure (Gaughan, 2005). The combination of companies with unequal managerial skills can result in efficiency gains (Ahern and Weston, 2007). An acquirer can also attempt to exercise market discipline through the removal of a target's perceivably incompetent management (Andrade, Mitchell and Stafford, 2001). Andersson and Svensson (1994) show that the greater the organizational and managerial skills of an acquirer, the more advantageous acquisitions are when compared to building new activities organically. Similarly, the greater the acquirer's technological skills, the more preferable greenfield operations become.

Managers can sometimes make the decision to engage in an acquisition based on irrational reasoning resulting from *enthusiasm* or *overconfidence*. Daniel (2001) points out that once acquisition considerations have proceeded to negotiations, the discussions can build up enthusiasm, and managers can get emotionally attached to the idea of acquiring a specific target. This pattern may positively contribute to the completion of some acquisitions. Malmendier and Tate (2008) measure CEOs' overconfidence in their ability to generate returns by the late exercise of options and by press-based indications of overconfidence. They show that overconfident CEOs are more likely to perform acquisitions and to overpay for their targets than their rational counterparts. In doing so, CEOs believe to be acting in the interest of both shareholders and themselves.

A more rational form of managerial empire building relates to *managerial ego*. Acquisitions motivated by managerial ego are not primarily driven by shareholder value creation objectives, but rather by executives' personal aims. Hitt, Harrison and Ireland (2001) observe that acquisitions are sometimes undertaken with the primary purpose of enhancing executive power. Martynova and Renneboog (2008) state that managers may

use acquisitions to achieve personal objectives. Although not always strategically optimal, managers may diversify in order to decrease the company's earnings volatility and hence protect their own positions through increased probability of success or corporate survival.

Seller perspective

In most acquisitions it is important that not only the buyer but also the target is willing to enter into the transaction. Figure 6 displays factors which affect targets' willingness to sell, categorized into two main groups: reasons related to owners, and reasons arising from the pursuit of financial and market strength. In addition to the factors shown in Figure 6, many of the ones presented above in the context of buyers' decision making also apply to sellers.

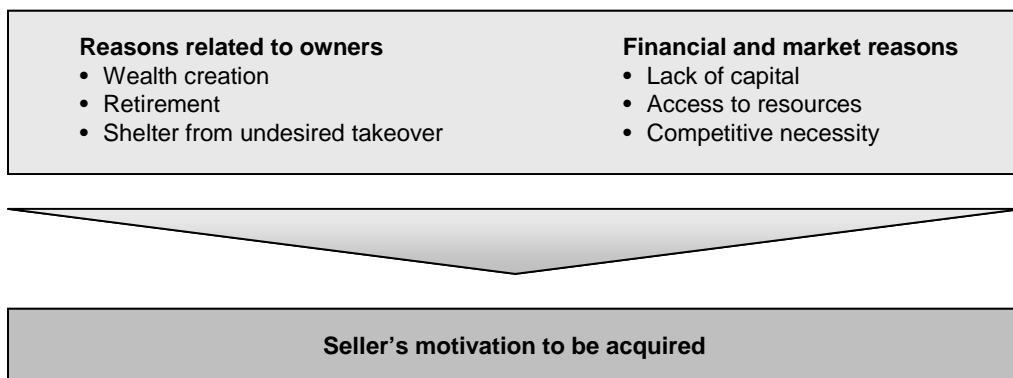


Figure 6: Factors contributing to sellers' decisions to be acquired

One of the fastest ways to *create substantive wealth* is to start or buy a company, develop and improve its operations, and later seek to sell it at a profit. As Sherman (2005) points out, “a merger or acquisition is frequently the happy ending to the tales written by productive and fortunate entrepreneurs”. Selling a company may also become necessary as a consequence of the owners’ *desire to retire* and a lack of successors (Sherman, 2005). A company can also obtain *shelter from an undesired takeover* by selling itself to a more attractive acquirer (Gardiner, 2006).

Financial reasons may force a company to be sold because of a *lack of capital* to grow. Being acquired by a larger company can also provide the target with *access to greater resources* (Sherman, 2005). A company can also be sold out of *competitive necessity*. Much like the acquirer may find it necessary to perform an acquisition in order to retain

its competitiveness, a seller may find it impossible to keep competing successfully as an independent entity and therefore seek to be acquired (Sherman, 2005).

2.3.2 Industry Level Drivers

Acquisition activity is often concentrated in a limited number of industries at any specific point in time. Andrade and Stafford (2004), among other researchers, provide evidence of significant clustering of acquisition activity according to the industry of the acquirer. The formation of activity clusters is often triggered by fundamental changes in the industry, such as technological developments, changes in supply and demand conditions, or new government policies (Mitchell and Mulherin, 1996; Gaughan, 2005). Factors that change the industry structure are referred to as *shocks* by many researchers (Gaughan, 2005). Mitchell and Mulherin (1996) define an industry shock as “any factor, whether expected or unexpected, that alters industry structure”. The use of the term is, however, not entirely consistent among the research community. While Mitchell and Mulherin do not require shocks to be unforeseen, Andrade, Mitchell and Stafford (2001) base their industry shock theory on the assumption that shocks are unexpected. Their results enforce the view that not only do acquisitions occur in waves, but acquisitions are clearly clustered by industry within each wave. Andrade, Mitchell and Stafford infer that a significant portion of acquisition activity is caused by industry level shocks. Further, they suggest that industry level activity is clustered in time because of the unexpectedness of these shocks.

This section discusses the general industry shocks most commonly introduced in research. These are deregulation, technological advances, changes in industry organization, and low sector growth. Table 2 displays selected examples of observed acquisition rationales in different industries for each of the drivers.

Table 2: Historical drivers of acquisition activity at industry level. Modified from Weston (2001); Sherman (2005); and Ahammad and Glaister (2008)

Driver	Acquisition rationale	Industry example
Deregulation	Economies of scale Efforts to develop a global presence Ability to follow clients internationally	Utilities Telecommunications Finance
Technological advances	Efforts to develop a global presence Overlap of different forms of media Difficulty to keep up with rapid change	Telecommunications Media High technology
Industry re-organization	Potential to increase competitiveness through restructuring	Information technology
Low sector growth	Efficient reaction to reduced demand Reduction of excess capacity New growth opportunities provided by international expansion	Aerospace and defense Automobiles Food and retail

Looking at historical acquisitions, *deregulation* repeatedly arises as an important factor contributing to periods of increased activity (Gaughan, 2005). National governments and central banks have the power to shape acquisition activity through regulatory changes (Gardiner, 2006). Most researchers agree that deregulation is an important driver of industry level acquisition activity (e.g. Jensen, 1988; Weston, 2001).

In regulated industries, government policies may hinder the creation of certain combinations of companies, thus keeping the industry artificially dispersed (Andrade, Mitchell and Stafford, 2001). Once deregulation takes place in the industry, the artificial constraints cease to exist. Consequently, companies become active in making acquisitions as they seek to increase their efficiency through changes in size and the level of business activity (Gaughan, 2005).

Although the research community is unanimous about the tendency of deregulation to enhance acquisition activity, deregulation can also influence activity in a reverse manner. Deans (2002) observes that in the early stages of the development of an industry, deregulation can drive deconsolidation.

Technological advances affect acquisition activity both at industry level and more generally. The general effects of technological innovations are discussed in Section

2.3.3 in the context of macro level drivers. Industry level technological innovations can drive acquisition activity by creating excess capacity and thereby a need for industry consolidation (Andrade, Mitchell and Stafford, 2001). In some industries, companies use acquisitions as an instrument to prepare for dramatic changes that are expected to occur, often due to technological developments (Hitt, Harrison and Ireland, 2001).

Rhodes-Kropf and Viswanathan (2004) recognize that new technologies and deregulation contribute to the occurrence of acquisition waves. They nevertheless suspect that such shocks alone are not sufficient to explain acquisition waves. Accordingly, they present a theory of stock market overvaluation, which is further discussed in Section 2.3.3.

Acquisitions in an industry can be triggered by *changes in industry organization*. A trend to switch from vertical to horizontal integration, among other changes, can trigger a wave of transactions in the industry (Weston, 2001).

Low sector growth has been identified as a factor contributing to increased acquisition activity in certain industries. Acquisitions can facilitate a company's exit from a business line which is not exhibiting sufficient growth. It is generally less expensive to perform an exit via acquisition than via bankruptcy in an industry burdened with overcapacity. Bankruptcy procedures can lead to the destruction of the entire organization, including such valuable parts which could be preserved in an acquisition (Jensen, 1988).

Not all researchers agree that industry shocks are a sufficient way to explain industry level concentration of acquisition activity. Powell and Yawson's (2005) analysis of data for the United Kingdom during 1986-2000 does not provide support for the operationalized hypothesis that broad industry shocks would significantly influence acquisition activity.

Some researchers see the emergence of acquisitions in clusters as a trend that catches from one company to another. Daniel (2001) refers to the clustering phenomenon as the "momentum of the number of deals being made". Similarly, Pryor (2001) notes that the acquisition process has "peculiar inner momentum". Pryor adds that the fear of losing out to competitors who have engaged in acquisition activity may be the driving force of some acquisitions.

Gaughan (2005) suggests that acquisition waves can result from several industry players suspecting that a competitor who has performed acquisitions is enjoying superior

benefits. The potential benefits include higher economies of scale in the case of horizontal deals, and an enhanced distribution system in the case of vertical transactions (Gaughan, 2005).

Notwithstanding the existence of several plausible motives for acquisitions, the classic finance textbook by Brealey and Myers (2003) lists the question “How can we explain merger waves?” as one of the ten unsolved problems in finance. Brealey and Myers acknowledge that it is usually possible to find reasons for individual acquisitions when they are singled out from acquisition activity at large. While this approach provides researchers with a separate special operationalized hypothesis for each acquisition, it does not provide a general operationalized hypothesis that would explain acquisition waves.

Bikhchandani, Hirshleifer and Welch (1998) suggest that decision makers’ *imitative behavior* can be an underlying reason for many behavioral patterns which converge to similar actions, such as acquisition waves. As it is often too time consuming, too costly, or simply infeasible to gather all information available to others, people can make decisions by observing others in similar situations and, assuming that they are rational, imitating that behavior. Bikhchandani, Hirshleifer and Welch refer to the resulting pattern as a *cascade*, noting that cascades are most important for discrete phenomena, such as situations where an acquirer can choose to either bid or to not bid for a target. Martynova and Renneboog (2008) support this logic, describing such managerial behavior as *herding*. In a wave, the first successful acquisitions encourage other companies to undertake similar acquisitions. The main motive of the latter transactions does not emerge from a purely economic rationale, but also from attempts to mimic the leaders.

Deans (2002) suggests that all industry consolidation activity can be explained with the concept of an *endgames curve*, depicted in Figure 7.

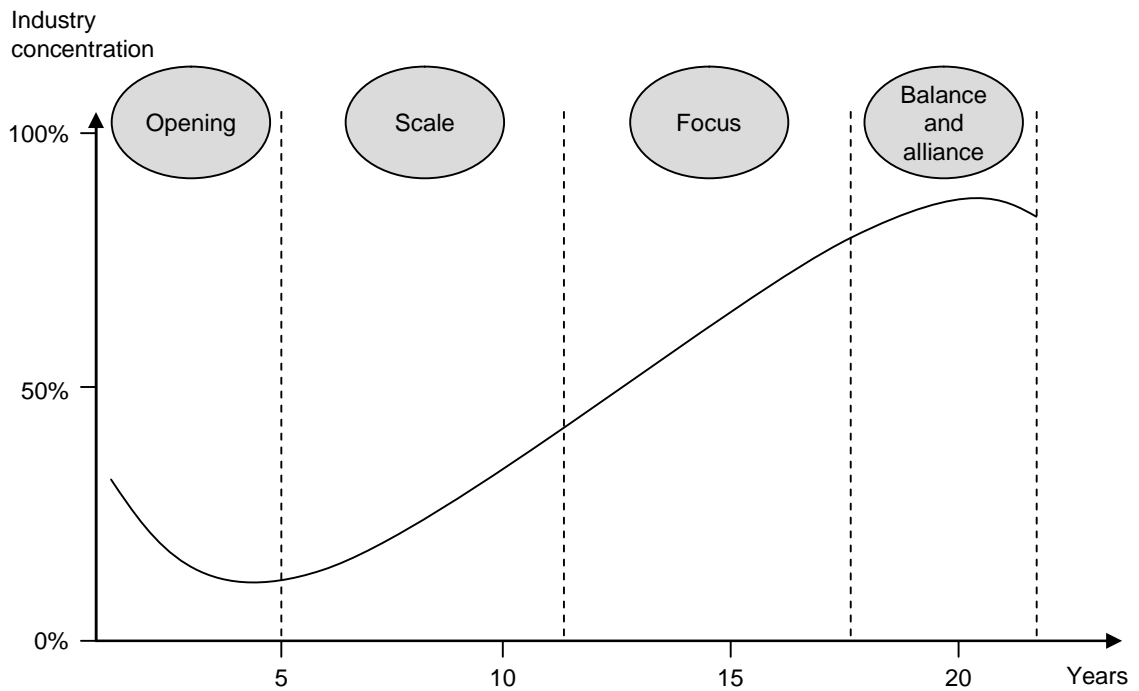


Figure 7: Endgames curve of industry consolidation. Modified from Deans (2002)

According to Deans (2002), industry concentration follows an s-shaped pattern. He defines industry concentration as the market share of the top three companies. In the *opening stage*, market consolidation is very low or non-existent, although some companies begin to take first steps in acquisition activities. In the *scale stage*, size becomes an important success factor, and major players begin to perform acquisitions. The companies which have emerged as the winners of the previous stages continue aggressive growth in the *focus stage*. They increasingly focus on their core business and dispose of secondary activities. In the final *balance and alliance stage* industry concentration can become as high as 90%. A few companies dominate the industry, and they may begin to form alliances with each other. At the end of the endgames curve, growth is nearly entirely fuelled by acquisitions.

2.3.3 Macro Level Drivers

Macro level, or economy-wide, drivers of acquisition activity can be divided into drivers that can be quantitatively measured in a well-defined manner and those that are more qualitative in nature. The main macro level drivers identified in literature are summarized in Table 3 and further discussed in this section.

Table 3: Macro level drivers of acquisition activity

Type	Driver	Rationale
Quantitative	Stock market conditions	Positive relationship between stock market performance and acquisition activity Low transaction costs and over-optimism prevalent during strong stock market conditions encourage acquisitions
	Credit market conditions	Wide availability of credit and low interest rates facilitate acquisition financing
	Economic environment	Strong economic growth and demand conditions favor acquisitions
	Business confidence	Positive business outlook encourages acquisitions Expected deterioration of business discourages acquisitions
	Industrial production	Growth in production increases acquisition activity
	Capacity utilization	Consolidation facilitates the reduction of excess capacity
	Exchange rates	Currency strength can affect attractiveness of cross-border acquisitions
Qualitative	Antitrust policies	Relaxation of restrictions imposed by antitrust policies can enhance acquisition activity
	Free trade	Liberalization of trade can increase the number of cross-border acquisitions
	Privatization	Privatization increases the number of companies available for acquisitions
	Economic or political unions	Single market and lower transaction costs facilitate cross-border acquisitions
	Technological change	Improvements in communication channels, transport and information technology facilitate the management of large companies

A favorable financial environment contributes in a positive manner to the pace of acquisition activity (Weston, 2001). Harford (2005) suggests that while acquisition waves are triggered by industry shocks, a shock alone is not sufficient to create a wave. Capital liquidity must also be sufficient for transaction costs to be low enough to generate a large volume of acquisitions.

Stock market conditions

A positive relationship between acquisition activity and *stock market conditions* has been observed by many researchers (Mitchell and Mulherin, 1996). Most researchers acknowledge that acquisition activity undergoes trends that are at least partially similar to those of stock market performance and occur fairly simultaneously with stock market cycles (e.g. Campa, 2006). Declining stock prices are associated with a decline in acquisition activity. Similarly, rising stock prices are favorable to strong acquisition activity (Weston, 2001). Each of the five acquisition waves of the 20th century ended with a downturn in the stock markets. This suggests that relatively strong capital markets are a precondition for the emergence of an acquisition wave (Martynova and Renneboog, 2008).

Deans (2002) analyzes the relationship between the number of transactions and stock index performance between 1989 and 2001. His regression analysis yields a coefficient of determination of 93% for the number of transactions in the United States and the Dow Jones Index. The results are also strong for Europe and the Euro Stoxx index, where he reaches a coefficient of determination of 80%. Brealey and Myers (2003) agree that each of the five merger waves of the 20th century coincided with a period of relatively high stock prices. Therefore they find it peculiar that none of the economic motives they have identified for acquisitions, such as economies of scale, efficiency improvements, or gains from complementarity, are related to the general level of the stock markets.

Many researchers agree that the direction of causality runs from stock market conditions to acquisition activity, and not vice versa. Scherer (2006) states that acquisition cycles are presumably influenced by the state of the stock markets. Deans (2002) argues that it is possible to predict acquisition actions and consolidation trends through stock market movements.

In their analysis of quarterly data covering the years from 1947 to 1977, Melicher, Ledolter and D'Antonio (1983) show that an increase in stock market performance is followed by an increase in acquisition activity, with a similar pattern holding for decreasing stock market performance and decreasing acquisition activity. The observed relationship is strongest with a lag of one quarter, indicating that acquisition completions tend to increase in frequency one quarter after a pick-up in the stock markets. However, they remark that acquisition negotiations generally begin on average

two quarters before completion, hence concluding that acquisition negotiations precede stock price movements. They suggest that negotiations reflect decision makers' anticipation of rising stock prices and the accompanying more receptive environment for acquisitions.

While the majority of researchers acknowledge the positive relationship between stock market performance and acquisition activity, debate exists about the reasons of the relationship. Two most often stated reasons are high valuations that lead to improved financing ability, and market optimism about the economic outlook (Komlenovic, Mamun and Mishra, 2009).

Deans (2002) suggests that rising stock prices are a key driver of consolidation booms. He reasons that increasing share prices make many transactions possible, because acquirers can use their high stock valuations to pay for the target. Martynova and Renneboog (2008) agree with Deans, noting that bidders' overvalued equity can be used as a cheap currency to pay for the target. They point out that, on average, bidders are more overvalued than their targets, and that the probability of using equity as a payment mechanism increases with the degree of the bidder's overvaluation.

Mueller (1989) suggests that a stock market boom creates a general state of optimism in the markets, and accordingly generates optimism among managers regarding their abilities to improve the performance of acquisition targets. He assumes that over-optimism in the stock markets also affects potential acquirers' managers. Roll (1986) refers to such over-optimism as *hubris*, a term which many researchers have adopted after him when referring to managerial overconfidence as a potential reason for acquisitions (Martynova and Renneboog, 2008). In an overly self-assured state of mind, managers can be affected by the typical human tendency to believe that statistical averages do not apply to them, and that they have sufficient skills or luck to succeed where others might not (Mueller, 1989).

Harford (2005) disagrees with the suggestion that the observed relationship between acquisition waves and stock market valuations would be caused by behavioral misevaluation. He concludes that acquisitions are rather driven by higher capital liquidity, and the accompanying lower transaction costs, which prevail at periods of high share valuations.

Shleifer and Vishny (2003) provide a further dimension to the discussion around stock market valuations by showing that misvaluation has an important role in acquisitions.

Acknowledging that markets do not always value stocks efficiently, they point out that equity-financed acquisitions made during periods of high stock market valuations tend to exhibit a pattern where acquirers are overvalued and targets, even if overvalued, are less so than acquirers. This is true for the acquisition waves of the 1960s and 1990s, which both saw high overall stock valuations, generally equity-financed transactions, and misvaluation. Shleifer and Vishny propose that, although markets are inefficient, decision makers are rational and use acquisitions to take advantage of the markets' misvaluations. Dong, Hirshleifer, Richardson and Teoh (2006) find further support for the operationalized hypothesis that stock market inefficiencies affect acquisition activity. They show that acquirers are generally more highly valued relative to targets, and that highly valued bidders are more likely to use stock as payment method rather than cash. They highlight that these results are complementary with research showing that high stock market valuations have a positive effect on aggregate acquisition activity.

Rhodes-Kropf and Viswanathan (2004) assume that companies are unable to determine what part of their own valuation is created by general market conditions and what part is due to company specific features. Therefore, when stock markets are overvalued, targets are likely to overestimate the synergies of a prospective transaction and are consequently more likely to accept it. Similarly, during periods of market undervaluation, targets are inclined to underestimate the synergies of a transaction and are therefore less likely to accept an offer.

Providing a further explanation for why acquisition activity picks up during stock market booms, Mueller (1989) points out that acquisitions can be made for reasons other than the expectation of improved profitability, including attempts to spread risks. He remarks that the best moment to undertake unpromising acquisitions is when the stock markets are up and investors are optimistic.

Credit market conditions

Acquisition financing often requires the use of external funds (Gardiner, 2006). Favorable *credit market conditions* are therefore found by many researchers to have a positive effect on acquisition activity. Good availability of third-party financing improves companies' access to the capital required to perform acquisitions (Sherman, 2005). Sherman and Badillo (2010) state that a reduction in the availability of credit has

a direct effect on the level of acquisition activity due to less currency being available to conduct deals. Low interest rates favor both internal growth and acquisitions, and they enable companies to cost-effectively finance acquisitions through debt (Weston, 2001; Sherman, 2005). Similarly, high cost of financing has a negative effect on acquisition activity (Komlenovic, Mamun and Mishra, 2009).

Melicher, Ledolter and D'Antonio (1983) find a significant, although weak, correlation between interest rates and acquisition activity. They observe that acquisition completions lag changes in interest rates by one quarter. They reason that the parties negotiating a prospective transaction anticipate the upcoming fall in interest rates and the consequent favorable financing environment for acquisitions.

Firstbrook (2007) states that the abundance and low costs of credit were among the main reasons for the strong acquisition activity of the mid-2000s. Accordingly, the slowdown in acquisition activity in 2007 was primarily due to the bad state of the credit markets (Granahan, 2008). Shivdasani and Wang (2011) study the drivers of the leveraged buyout boom of the mid-2000s, concluding that developments in the structured credit market were associated with an increase in leveraged buyout volumes. While they do not suggest that this was the only growth driver of leveraged buyouts, they argue that favorable changes in the availability and pricing of structured credit had a significant positive effect on leveraged buyout volumes.

Economic environment

A *favorable economic environment* has been found by many researchers to have a positive effect on acquisition activity (e.g. Weston, 2001). Similarly, stressed economic conditions have been found to impede acquisition activity (Granahan, 2008).

Several researchers suggest that strong economic growth is favorable to the intensity of acquisition activity (Weston, 2001; Martynova and Renneboog, 2008). Economic growth in the home countries of potential acquirers can increase their profits and equity values, thereby creating a larger pool of capital available to finance acquisitions (Ahammad and Glaister, 2008). Economic growth also makes a target's performance outlook more positive, rendering an acquisition more attractive (Sherman and Badillo, 2010). Scherer (2006) observes that acquisition activity is positively correlated with changes in real gross domestic product.

Campa (2006) suggests that acquisition activity is affected by the business cycle and demand conditions. In his study of acquisitions motivated by economies of scale, Lambrecht (2004) finds that such acquisitions are positively correlated with product market demand. He concludes that acquisition activity occurs in cyclical patterns around the cyclical demand, because companies seek to grow in size especially when they anticipate large demand.

In his study of the patterns of Finnish acquisition activity, Ali-Yrkkö (2002) observes that the activity moves broadly in line with economic cycles. He shows that acquisition activity was high during the booms of the 1980s and the early 2000s, and similarly low during the early 1990s when Finland ran into an economic crisis.

Other quantitative macro level drivers

According to Gardiner (2006), the timing of acquisitions depends partly on the general state of *business confidence*. Gardiner assumes that decision makers are unlikely to perform a significant acquisition if they expect business to deteriorate in the near future. Similarly, Komlenovic, Mamun and Mishra (2009) suggest that the number of expansionary acquisitions rises when firms' outlook for future demand improves.

Existing literature has found mixed results about the relationship between *industrial production* and acquisitions. Nelson (1959) finds a positive relationship between acquisitions and industrial production, implying that growth in production leads to increases in acquisition activity. The time series analysis of Melicher, Ledolter and D'Antonio (1983), however, suggests that changes in acquisition activity precede changes in production. Supporting the results of both Nelson and Melicher, Ledolter and D'Antonio, Cook (2007) finds bidirectional causality between acquisition activity and industrial production. Guerard (1989), in contrast, does not find any causal relationship between acquisition activity and industrial production.

Literature contains mixed results about the relationship between *capacity utilization* and acquisition activity. Some researchers have found a positive relationship between the two variables (Komlenovic, Mamun and Mishra, 2009), whereas others suggest a negative relationship (e.g. Jensen, 1993).

Komlenovic, Mamun and Mishra (2009) state that acquisitions enable acquirers to meet increasing demand by allowing them to increase capacity instantly. Their panel

regression results support the view that acquisitions allow acquirers to increase capacity and output quickly in order to meet increasing demand.

Jensen (1993) provides a different view about the relationship between acquisition activity and capacity utilization. He states that acquisitions have played a significant role in reducing excess capacity in both the nineteenth and the twentieth centuries. He reasons that acquisitions lead to the consolidation of independent firms and closing down of marginal production facilities. Wood (2009) finds that acquisitions are used as a means for substantial capacity reductions, as exit barriers prevent capacity from otherwise declining to an efficient level. Iannotta (2010) supports Jensen's and Wood's views, stating that excess capacity drives acquisitions by creating a need for consolidation.

The findings of Andrade and Stafford (2004) support both views of the relationship between capacity utilization and acquisitions. They state that acquisitions can be motivated by low capacity utilization. Indeed, their regression analysis finds a negative relationship between industrial capacity utilization and acquisitions in the 1970s and 1980s. However, the relationship becomes positive in the 1990s, indicating that acquisitions can play both a contractionary and an expansionary role.

Scherer (2006) analyzes the relationship between acquisition activity and *productivity* growth in the United States. His findings suggest that no significant correlation exists between the two variables. However, he points out that this can potentially be due to a high level of aggregation or difficulties in measuring productivity. He thus cautiously concludes that the correlation between productivity growth and acquisition activity may not be as strong as many may believe.

In the context of cross-border acquisitions, *exchange rates* can affect the level of activity. If the currency of the potential acquirer's country strengthens relative to the currency of the prospective target's country, the acquisition becomes financially more appealing to the acquirer (Raghavan, 2003).

Qualitative macro level drivers

Macro level drivers that have a more qualitative nature can result from governmental or political decisions, or from technological developments. The degree of government intervention in acquisitions affects the amount of accepted transactions. Different governments and administrations have different approaches, with some being more

aggressive than others in preventing possibly anti-competitive transactions (Sherman, 2005). The relaxation of governmental restrictions on acquisition activity imposed by *antitrust policies* can create a climate where companies need to restructure in order to operate efficiently (Jensen, 1988). Economic policies aimed at furthering globalization can encourage firms to engage in large restructuring activities (Campa, 2006).

Free trade and the opening up of new markets to international business have a positive impact on the levels of acquisition activity (Daniel, 2001). Global acquisition activity reflects the fact that many nations have entered into international agreements aiming at freer trade (Weston, 2001; Ahern and Weston, 2007). Ahammad and Glaister (2008) propose that governments' efforts to reduce trade barriers are the main driver of increases in the number of cross-border acquisitions. In addition to the liberalization of trade, the liberalization of capital movements has contributed to the acceleration of acquisition activity (OECD, 2001).

Privatization is another governmental factor that influences acquisitions (OECD, 2001). It contributes to high levels of acquisition activity by increasing the number of companies available for transactions and by opening up economies to more competition (Ahammad and Glaister, 2008).

In Europe, the creation of a *single market* in 1993 and the introduction of a *common currency*, the euro, in 1999 are likely to have had a positive effect on acquisition activity (Campa, 2006; Fontaine, 2006). The euro has facilitated companies' access to the funds required to finance acquisitions (Campa, 2006). Furthermore, the common currency has reduced exchange rate risks and transaction costs (Ahammad and Glaister, 2008). The European Union is slowly homogenizing the legislation of its member countries. However, different national systems of takeover regulation and structural barriers to takeovers still exist (Moschieri and Campa, 2009). Although unification activities have led to increased internationalization, most acquisitions still take place domestically within European countries (Campa, 2006).

According to Weston (2001) and Campa (2006), the accelerating pace of *technological change* in the 1990s contributed to the increase in acquisition activity during the decade. Ahern and Weston (2007) suggest that technological development has also been the most influential driver of acquisition activity in the 2000s. Improvements in communication channels and transport and their reduced costs have created a global

economy where companies can become international more easily than before (Weston, 2001; Ahern and Weston, 2007; Ahammad and Glaister, 2008).

Daniel (2001) points out that technological developments contribute to acquisition activity by facilitating the process of managing a global business. Ahammad and Glaister (2008) add that rapid technological change can lead to an increased number of high-risk research and development projects. In such instances acquisitions can enable companies to access new technological assets and share the costs of innovation (Ahammad and Glaister, 2008).

In particular, advances in information technology have helped drive global acquisition activity (OECD, 2001). Information technology innovations have led to a drastic decrease in communication costs. They have also expanded the set of products and services which can be traded in global markets, as nearly anything that can be digitalized into computer code can be treated as a tradable product (Campa, 2006). Basing their statement on the underlying assumption that there exists an optimal size for each company, Ahammad and Glaister (2008) suggest that developments in information technology have made the optimal size of firms larger than in the past. Acquisitions can be used to grow to reach the optimal size.

2.4 Literature Based Framework and Hypotheses

This section presents a literature based framework of factors affecting acquisition activity, constructed based on findings from existing research. Hypotheses are then developed concerning the effects of quantitative macro level factors on acquisition activity.

The literature based framework is presented in Figure 8. The model encompasses the key drivers of acquisition activity identified in literature, grouped into micro, industry, and macro level drivers.

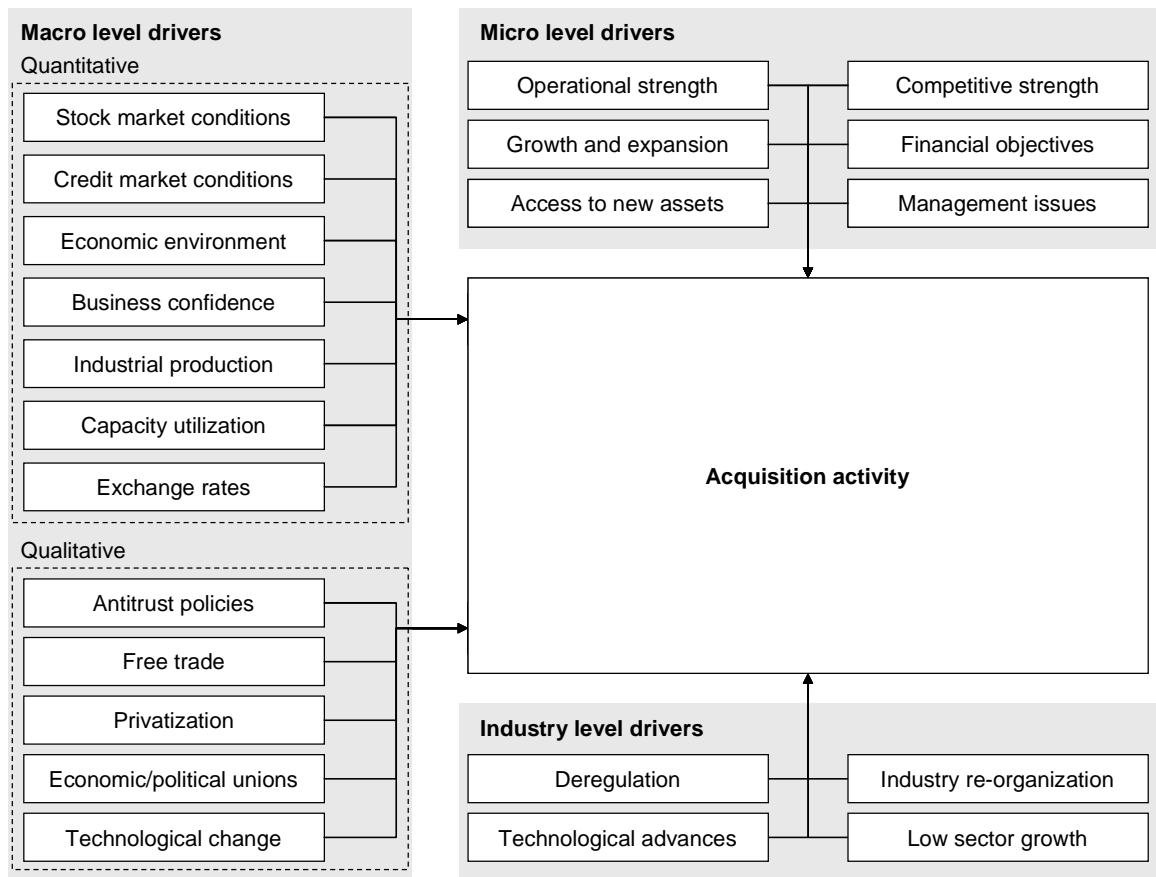


Figure 8: Literature based framework of the drivers of acquisition activity

As discussed in Section 2.3.1, micro level drivers of acquisition activity are company specific factors that affect buyers' motivation to buy or sellers' motivation to sell. Companies may engage in acquisitions because they wish to gain operational strength, grow, or obtain access to new assets. Further reasons include a wish to improve one's competitive position, as well as financial or purely managerial objectives.

Industry level drivers were discussed in Section 2.3.2. Acquisition waves in specific industries are typically caused by industry shocks. Such shocks can be manifold and sometimes unique, however the most commonly observed industry level drivers include deregulation, technological innovation, industry re-organization, and low sector growth.

Macro level drivers were discussed in Section 2.3.3. The literature based framework presents macro level drivers of acquisition activity in two separate sub-groups based on whether they are quantitative or qualitative in nature. Qualitative macro factors include governmental or political decisions, such as antitrust policies, free trade, privatization, economic and political unions, as well as technological developments. Quantitative

macro level drivers are the focus of the empirical part of this study. The remainder of this section introduces hypotheses concerning the quantitative macro level drivers.

Positive stock market conditions have been found by many researchers to have a positive relationship with acquisition activity (e.g. Mitchell and Mulherin, 1996; Campa, 2006). The first hypothesis is developed in accordance with this view:

Hypothesis 1: Positive stock market conditions are positively related to acquisition activity.

Many researchers have stated that favorable credit market conditions have a positive impact on acquisition activity, because good availability of third-party funding and low interest rates facilitate acquisition financing (e.g. Weston, 2001; Sherman and Badillo, 2010). Thus the second hypothesis is:

Hypothesis 2: Favorable credit market conditions are positively related to acquisition activity.

Several researchers have suggested that a favorable economic environment positively influences acquisition activity (e.g. Weston, 2001; Martynova and Renneboog, 2008). Hence, the third hypothesis is formulated as:

Hypothesis 3: A favorable economic environment is positively related to acquisition activity.

The general state of business confidence in an economy has been suggested by some researchers to have a positive impact on acquisition activity (e.g. Gardiner, 2006; Komlenovic, Mamun and Mishra, 2009). The fourth hypothesis is:

Hypothesis 4: Business confidence is positively related to acquisition activity.

Industrial production has been found by some researchers to be positively related to acquisition activity (Nelson, 1959; Melicher, Ledolter and D'Antonio, 1983; Cook , 2007). Their results are, however, not unanimous about the direction of causality. The fifth hypothesis is:

Hypothesis 5: Industrial production is positively related to acquisition activity.

Existing literature contains mixed results about the relationship between industrial capacity utilization and acquisition activity. Many researchers have suggested that capacity utilization is negatively related to acquisition activity (Jensen, 1993; Wood, 2009; Iannotta, 2010), whereas some have found a positive relationship (Komlenovic, Mamun and Mishra, 2009). The sixth hypothesis is developed in accordance with the view of the majority of researchers:

Hypothesis 6: Industrial capacity utilization is negatively related to acquisition activity.

Finally, exchange rates can affect the level of acquisition activity between countries with different currencies (Raghavan, 2003), which leads to the seventh hypothesis:

Hypothesis 7: Currency strength in the acquirer's country is positively related to acquisition activity from that country into other countries.

Operationalizations of the hypotheses will be developed in Section 3.3. The literature based framework will be evaluated in light of empirical research in Section 4.3.

3 Research Methodology

This chapter describes the methodology used in the empirical part of this study. Section 3.1 provides an overview of the transaction data used in the quantitative analysis. Section 3.2 develops operationalizations of the independent and dependent variables. Section 3.3 presents operationalizations of the hypotheses developed in Section 2.4. Section 3.4 presents the statistical methods used in the quantitative analysis of Chapter 4.

3.1 Sample of Transaction Data

The transaction data used in this study was retrieved from the SDC Platinum database maintained by Thomson Reuters. The database covers circa 672,000 global mergers, acquisitions and alliances from 1985 onwards. It includes all corporate transactions that involve at least 5% of a company's ownership. The database covers transactions valued at USD 1 million or more, as well as transactions where the value has not been disclosed, for the entire date range. Deals of a disclosed value below USD 1 million are included from 1992 onwards.

The data set used in this study is a subset of the entire merger and acquisition data set available in SDC. The scope of the data set is defined based on criteria relating to geographical location, transaction value, time, and deal status. The criteria are summarized in Table 4.

Table 4: Criteria used to define the data set

Dimension	Criterion
Acquirer nationality	Finnish
Target nationality	Any nationality
Transaction value	Any value, including non-disclosed values
Announcement date	From January 1, 1992 to December 31, 2009
Deal status	Any status

The data set is limited to transactions with a Finnish acquirer. The target can be of any nationality. SDC determines a company's nationality based on the country where the company's primary business or division is located. Hence a Finnish acquirer in this study refers to a company whose primary business location is in Finland, regardless of the nationalities of the company's owners. Also, of relevance in terms of nationality is the acquiring company rather than its ultimate parent; therefore a Finnish subsidiary of a foreign parent company is classified as Finnish, if the company performing the acquisition is the subsidiary and not the parent.

Transactions of all values are included in the data set, including those for which the value has not been publicly disclosed.

The data set includes transactions announced between 1992 and 2009. The main reason for starting from 1992 is the unavailability of deals valued under USD 1 million prior to 1992. Another reason is that the data provider Thomson Reuters is reasonably confident of the completeness of the data only from the 1990s onwards (Pryor, 2001).

The date of the transaction is defined in this study as the date when the transaction was announced or when it otherwise became public knowledge. This date is in many cases, although not always, before the date of completion. As this study focuses on factors that motivate companies to engage in acquisitions, the most appropriate measure of time is the one providing the earliest indication of a company's intention to undertake an acquisition. Optimally, the date would be defined as the point in time when the decision to engage in the acquisition is first made. However, this date is rarely available. The announcement date is the earliest date available for a large number of transactions, and it is therefore used as a proxy for the timing of the acquisition decision.

Although the majority of transactions included in the data set have been completed, the data set also includes pending, intended, withdrawn, and rumored transactions, as well as transactions with an unknown status. Definitions of each status are provided in Table 5.

Table 5: Deal statuses included in the data set

Deal status	Definition
Completed	Transaction has closed
Pending	Transaction has been announced but has not yet been completed or withdrawn
Intended	Acquirer has announced that they expect or propose to make an acquisition
Withdrawn	Prospective acquirer or target has terminated its agreement, letter of intent, or plans for an acquisition
Rumor	Reports about a likely transaction have been published in the media, however the transaction parties have not made a formal announcement
Status unknown	SDC does not have data about the status

3.2 Operationalization of Variables

This section presents operationalizations of the variables of the literature based framework which will be used in the empirical analysis.

3.2.1 Dependent Variables

The aim of this study is to explain acquisition activity. The most typical measures of acquisition activity include the number of acquisitions and their value (Cook, 2007). This study uses the number of acquisitions rather than deal value for three reasons. First, the sample used contains a large amount of missing deal values, with values available only for 23% of the deals. A large portion of undisclosed values leads to deal numbers being a more reliable series than deal values (Town, 1992). Second, the actual number of acquisitions in a given period is a more commonly used measure of acquisition activity than their financial value, as indicated by empirical literature (Cook, 2007).

Third, using transaction numbers rather than values has the advantage of mitigating the effect of megadeals on the results.

A *natural logarithmic transformation of the number of acquisitions* is employed to stabilize the variance of the dependent variable. The frequency of the acquisition data is selected to be one quarter. This selection provides a balance between having a sufficient amount of data points, with each data point still consisting of a sufficient amount of transactions.

One of the three models built in this study assesses only cross-currency transactions. The dependent variable in that model is the *natural logarithm of the number of cross-currency acquisitions*. It includes only such acquisitions where the target company's country does not use and has not used the Finnish mark or the euro as its currency.

The original acquisition data retrieved from SDC contains some entries where the same transaction has been recorded twice. Duplicate transactions have been manually removed from the data. The data also contains instances where the same acquirer has purchased parts of a target in several consecutive transactions. Such serial transactions have also been removed, so that they are only represented as one transaction in the data set.

3.2.2 Independent Variables

Stock market conditions

Stock market conditions in a certain market are typically measured with a stock market index that reflects the current status and changes in that market (Harford, 2005; Springer, 2006; Komlenovic, Mamun and Mishra, 2009). Accordingly, stock market conditions are measured in this study with a *weight capped all-share index of the Helsinki Stock Exchange*, currently called OMX Helsinki Cap. The data is sourced from Thomson Reuters Datastream. The weight capped index does not allow for the weight of any share to exceed 10%, which prevents any one large company from excessively affecting the variable.

The value of the OMX Helsinki Cap index over quadrupled from 1992 to 2009. The data is transformed to its natural logarithm in order to level off the growth. Further, the aim of the dependent variable is to reflect relative stock market strength at a certain point in time. Due to the inherent growth of the index over time, the value of the index does not allow for comparison of market strength over long periods of time. As a

consequence, this study uses the *difference between the natural logarithm of the index and its trendline* as the independent variable. This difference shows whether, at a certain point in time, stock markets are performing better or worse than their long-term expected value around that time.

Credit market conditions

Credit market conditions can affect acquisition activity through the cost and availability of financing (Firstbrook, 2008). Cost of financing is typically measured by interest rates (Komlenovic, Mamun and Mishra, 2009). This study uses *12-month interbank rates* quoted by the Bank of Finland. Interbank rates were measured by Helibor before Finland adopted the euro on in the beginning of 1999, after which the reference interest rate has been Euribor.

The Finnish interest rate environment underwent a critical change in the mid-1990s. Interbank rates were high and fluctuated substantially in the early 1990s. After the mid-1990s, however, interest rates remained much more stable. Finland joined the European Exchange Rate Mechanism in October 1996. The mechanism aimed at reducing exchange rate variability and inducing monetary stability through fixed exchange rate margins, while allowing exchange rates to vary within the margins. The selected exchange rate level at which the Finnish mark was linked to the mechanism was close to the market rate. As a consequence, the immediate impact on exchange rates and interest rates was not substantial. In the longer run, however, the link-up stabilized the external value of the Finnish mark and interest rates (Korhonen, 2001).

Finland's joining the European Exchange Rate Mechanism was a major change in macroeconomic policy which would likely cause for the coefficients of an estimated model to be different before and after the change. However, the data set before the event would only consist of 19 quarters, providing a very small sample size. As a consequence, interbank rates as an independent variable are only included after Finland had joined the European Exchange Rate Mechanism, i.e. from the fourth quarter of 1996 onwards.

Availability of financing is more difficult to measure than the cost of financing. Most researchers use interest rates as a measure of the availability of cheap financing. However, the pure availability of, or access to, financing regardless of its cost reflects whether a company could obtain credit if it wanted to. No suitable data appears to be

available to measure this. A proxy for the availability of financing could be the change in companies' debt, which consists mainly of loans and bonds. This data is available from the Bank of Finland, although only from the year 2000 onwards. Hence, the use of change in debt as an independent variable would considerably decrease the sample size. A data set which is available from the Bank of Finland for the entire focal time period is the value of bonds issued by companies. However, this measure reflects the actions of individual companies rather than the macroeconomic credit environment, as a single bond issue can considerably affect the total value of issues in a specific quarter. Also, bonds are mostly issued by large corporations, whereas acquisitions can also be made by smaller ones. Hence, this measure would not match well the scope of the data set. Further, bonds typically only represent a small part of a company's debt. According to the Bank of Finland, bonds represented 10% of non-financial Finnish corporations' debt in the third quarter of 2009. This measure would therefore only reflect a small part of credit financing used for acquisitions.

As a result of limited data availability, no operationalization is developed for the availability of financing. This is in line with existing literature, the majority of which settles for using interest rates as a measure of credit market conditions. However, inflation, a measure introduced later in this section, can be partly caused by high availability of credit, which allows for indirectly capturing some effects of credit availability (Boschi and Girardi, 2007).

Economic environment

The state of the economic environment can be measured by the growth of gross domestic product (Scherer, 2006; Komlenovic, 2009), or by demand conditions (Lambrecht, 2004; Campa, 2006). In this study, *total demand* is selected to measure the economic environment. Total demand, which equals total supply, reflects the sum of both gross domestic product and imports. Hence, it is a holistic measure of economic activity. The value of total demand is sourced from Statistics Finland.

Total demand exhibits seasonal behavior, with demand typically peaking in the fourth quarter of each year. A seasonally smoothed demand time series is therefore used instead of original values.

Total demand grows in the long run, which causes the time series to be non-stationary. First differences of total demand are employed to induce stationarity. Hence, the

independent variable adopted to reflect the economic environment is the *first difference of seasonally smoothed total demand*.

Business confidence

The Confederation of Finnish Industries conducts quarterly business tendency surveys that follow the business cycle and business outlook. The survey respondents in the first quarter of 2010 consisted of 1,091 companies employing 270,000 people. This study uses the business tendency survey addressed to industrial companies as a source of measurable variables for business confidence, industrial production, and capacity utilization. The survey asks industrial companies a selected set of questions with three answer options, and reports the share of respondents in each answer category.

The business tendency survey measures respondents' business confidence by asking them whether they expect the business outlook to improve, remain the same, or decline. This study measures business confidence by the *percentage of respondents stating that they expect the business outlook to improve*.

Industrial production

The business tendency survey of the Confederation of Finnish Industries asks respondents whether they expect their production to increase, remain the same, or decrease in the next three months. This study measures industrial production with the *percentage of respondents stating that they expect production to increase in the next three months*. The data is seasonal, with production typically expected to increase in the second and fourth quarters. A *backward-looking four-quarter moving average* is employed to obtain a non-seasonal data series. A four-quarter moving average of an independent variable is also used by Harford (2005), against which he plots acquisition activity.

Capacity utilization

The business tendency survey addresses capacity utilization by asking industry players whether they currently have excess capacity, the right amount of capacity, or too little capacity. This study measures capacity utilization by the *percentage of respondents stating that they have excess capacity*. The more respondents state that they have excess capacity, the lower is the capacity utilization.

Exchange rates

Foreign exchange rate becomes a relevant variable in the context of deals where the acquirer and target are located in countries with different currencies. As will be described in Section 4.1, Sweden is the most common target country for cross-border acquisitions by Finnish companies. Germany exhibits the second largest number of cross-border acquisitions. However, as both Finland and Germany adopted the euro in the beginning of 1999, exchange rates between the two countries would only be relevant prior to that. Consequently, *the exchange rate of the Swedish crown against the Finnish mark* is selected to measure foreign exchange rates. The data is sourced from the Bank of Finland. After Finland joined the euro in the beginning of 1999, the exchange rate of the Swedish crown against the euro is taken as a basis, dividing each figure by the conversion factor from euro to Finnish mark to obtain an internally consistent data series across the focal time period.

The Finnish exchange rate environment underwent an important change when Finland joined the European Exchange Rate Mechanism in October 1996. Similarly as with interest rates, exchange rates are used as an independent variable only for the time period starting from the fourth quarter of 1996.

Inflation

Inflation can be defined as the loss of purchasing power of money over time (Boschi and Girardi, 2007). Although inflation has not been used in the operationalization of any individual variable of the literature based framework, it is linked to several of them. Interest rates, availability of credit, the economic environment, business confidence, and capacity utilization have all been found to be related to inflation.

Koedijk, Kool and Kroes (1994) find a significant relationship between interest rates and expected inflation rates. Boschi and Girardi (2007) note that high availability of credit can lead to high inflation. If large amounts of credit are made available by the financial system, money supply increases, which leads to inflation. Boschi and Girardi also suggest that inflation is positively related to changes in demand. Increases in demand which are not met by corresponding increases in supply lead to an increase in price levels. Inflation can also be positively influenced by high business expectations and confidence, as well as rising industrial capacity utilization (Sveriges Riksbank, 1999).

As a result of these linkages, inflation is selected as an additional independent variable in the empirical analysis, with the data sourced from Statistics Finland. The inclusion of inflation allows for the examination of the entire time period from the first quarter of 1992 onwards, which is not allowed by interest rates. Also, inflation allows for the indirect inclusion of the effects of credit availability in the empirical model.

Dummy variables

Acquisition activity is seasonal, with more activity taking place in the winter than in the summer. The third quarter typically exhibits a low number of transactions due to summer vacations, whereas the fourth quarter generally has a lot of activity (Sherman and Badillo, 2010).

Seasonality can be accounted for by introducing dummy variables to the regression equation. When an intercept is used in the regression, the number of dummy variables must be one less than the frequency of the data (Brooks, 2008). Quarterly data hence calls for three dummy variables. As the third quarter exhibits the least acquisition activity, dummy variables are introduced for the first, second, and fourth quarters. Their coefficients reflect how much higher activity is in each respective quarter than in the third quarter.

3.2.3 Summary of Operationalizations and Data Sources

Table 6 presents the variables introduced in the literature based framework in Section 2.4, along with their operationalizations, as well as abbreviations and data sources of the operationalized variables used in this study.

Table 6: Summary of operationalizations and data sources

Theoretical variable	Operationalized variable	Abbreviation of operationalized variable	Data source
Acquisition activity	Natural logarithm of the number of acquisitions	Ln(number of transactions)	SDC Platinum
Stock market conditions	Difference between the natural logarithm of the weight capped all-share index of the Helsinki Stock Exchange and its trendline	Ln(share index) - trendline	Datastream
Credit market conditions	12-month interbank interest rates	Interest rate	Bank of Finland
Economic environment	First difference of seasonally smoothed total demand	First difference of demand	Statistics Finland
Business confidence	Percentage of respondents stating that they expect the business outlook to improve	Expected cycle outlook improvement	Quarterly business tendency survey by the Confederation of Finnish Industries
Industrial production	Backward-looking four-quarter moving average of the percentage of respondents stating that they expect production to increase in the next three months	Expected production increase	Quarterly business tendency survey by the Confederation of Finnish Industries
Capacity utilization	Percentage of respondents stating that they have excess capacity	Excess capacity	Quarterly business tendency survey by the Confederation of Finnish Industries
Exchange rates	Exchange rate of the Swedish crown against the Finnish mark	Exchange rate (FIM to SEK)	Bank of Finland
Several variables	Inflation	Inflation	Statistics Finland
Dummy variables for seasonality	Dummy variables for first, second, and fourth quarters	Dummy for Q1 Dummy for Q2 Dummy for Q4	-

3.3 Operationalized Hypotheses

This section presents operationalized hypotheses developed on the basis of hypotheses and variable operationalizations introduced in sections 2.4 and 3.2, respectively.

Hypothesis 1 can be tested with the following operationalization:

Operationalization of hypothesis 1: Stock market performance is positively related to the number of acquisitions.

Hypothesis 2 is related to credit market conditions, which reflect both the cost and the availability of credit. The second operationalization relates only to the cost of credit due to data not being available to measure access to credit markets:

Operationalization of hypothesis 2: Interest rates are negatively related to the number of acquisitions.

Hypotheses 3 to 7 give rise to the following operationalizations:

Operationalization of hypothesis 3: Total demand is positively related to the number of acquisitions.

Operationalization of hypothesis 4: Expected improvement in the business outlook is positively related to the number of acquisitions.

Operationalization of hypothesis 5: Increasing production is positively related to the number of acquisitions.

Operationalization of hypothesis 6: Excess capacity is positively related to the number of acquisitions.

Operationalization of hypothesis 7: Strong exchange rate of the currency in the acquirer's country relative to other countries is positively related to the number of acquisitions from that country into other countries.

In addition to the hypotheses and their operationalizations arising from the literature based framework, a further operationalized hypothesis is developed to assess the potential effect of inflation on acquisition activity. As the relationship between inflation and acquisition activity has not, to the best of the author's knowledge, been presented in previous literature, there is no prediction about the sign of the relationship. The eighth operationalized hypothesis is stated as follows:

Operationalization of hypothesis 8: Inflation is related to the number of acquisitions.

The operationalized hypotheses will be empirically tested in Chapter 4.

3.4 Statistical Methods

3.4.1 Overview of Multiple Linear Regression

The statistical method employed in the empirical analysis of this study is multiple linear regression analysis. The method selection is based on the dependent and independent variables in this study being continuous, apart from the dummy variables which are categorical. According to Dobson and Barnett (2008), the statistical method best suited for a continuous dependent variable and categorical and continuous independent variables is multiple regression.

A multiple linear regression equation is of the form

$$y_t = \alpha + \sum_{i=1}^k \beta_i x_{it} + u_t, \quad t = 1, 2, \dots, T, \quad (1)$$

where y_t is the dependent variable, $x_{1t}, x_{2t}, \dots, x_{kt}$ are k explanatory variables, α is a constant term, $\beta_1, \beta_2, \dots, \beta_k$ are k partial regression coefficients, and u_t is an error term.

The approach used in this study to fit the predicted values to the data is ordinary least squares.

3.4.2 Assumptions and Diagnostic Tests

The main assumptions underlying multiple linear regression analysis are (1) zero expected value of the error terms, (2) constant variance of the error terms, (3) zero correlation between the error terms, and (4) normality of the error term distribution. In addition, independent variables should not be too highly correlated with each other. Furthermore, the estimated parameters should be constant for the entire sample. Finally, the data series used in the regression should be stationary. Each of these assumptions is presented briefly in this section.

The first assumption requires that the expected value of the error terms is zero. If the regression equation includes a constant term, this assumption is not violated (Brooks, 2008).

The second assumption requires that the error terms are homoskedastic. Whether or not the error terms have a constant variance can be visually assessed by plotting the error terms over time as well as against each variable. Heteroskedasticity can also be detected with statistical tests, such as the Goldfeld-Quandt test (Verbeek, 2008).

The third assumption requires that the error terms are not autocorrelated. Autocorrelation can be visually detected by plotting the error terms \hat{u}_t over time or against their previous values \hat{u}_{t-1} , \hat{u}_{t-2} , A common test to detect first-order autocorrelation is the Durbin-Watson test. A more general test for autocorrelation is the Breusch-Godfrey test, which can be used to test also for higher orders of autocorrelation (Brooks, 2008).

The fourth assumption requires that the error terms are normally distributed. Normality can be visually assessed with a histogram of the residuals. A common test for normality is the Bera-Jarque test, which assesses how close the skewness and kurtosis of the error distribution are to those of a normal distribution (Brooks, 2008).

If explanatory variables are so highly correlated with each other that they lead to unreliable regression estimates, they exhibit *multicollinearity* (Verbeek, 2008). In such occasions, it may be difficult to identify the individual impact of each variable on the dependent variable. An important diagnostic to detect multicollinearity is the variance inflation factor, which shows how much the variance of a coefficient increases because of correlation between explanatory variables. Variance inflation factors exceeding the value of ten imply significant problems with multicollinearity (Montgomery and Peck, 1992).

Parameter stability is an implicit assumption behind the existence of one regression model for a certain sample. When a model has stable parameters, the related sample does not have a structural break (Verbeek, 2008). Parameter stability can be tested with the Chow test, which splits the data into sub-periods and compares the obtained models (Brooks, 2008).

A data series can be defined to be *stationary* if it has a constant mean, constant variance, and constant autocovariances for different lags (Brooks, 2008). The use of non-stationary time series can lead to *spurious regressions*. This occurs when two variables that trend over time are regressed one over the other, leading to results that appear to be significant but have no economic meaning. Regressions with non-stationary data can lead to unreliable significance tests and R^2 values. Non-stationarity can be tested with

the Dickey-Fuller test, which regresses the first difference of a variable on its lagged value and assesses the estimated coefficient of the lagged value. This test is valid if the error terms of the estimated regression are not autocorrelated. In the case of autocorrelated error terms, an augmented version of the Dickey-Fuller test should be used (Enders, 1995). The Dickey-Fuller test can be performed allowing the test equation to include a trend, a constant term, neither, or both. The selection between these depends on the characteristics of the time series in question (Elder and Kennedy, 2001). The Dickey-Fuller tests are based on a null hypothesis of non-stationarity. The stationarity test developed by Kwiatkowski, Phillips, Schmidt and Shin (1992), later referred to as the KPSS test (Verbeek, 2008), tests the null hypothesis of stationarity.

3.4.3 Lags

The operationalized hypotheses presented in Section 3.3 aim at assessing whether there exists a relationship, positive or negative, between dependent and independent variables. The operationalized hypotheses do not, however, contain a view about the *dynamic structure* of the relationship. Changes in an independent variable often do not affect the dependent variable straight away, but with a *lag*. This is typically caused by the inertia of the dependent variable, resulting from either psychological, technological, or institutional factors (Brooks, 2008).

Existing literature contains highly mixed views about the time it takes for changes in different variables to affect acquisition activity (e.g. Guerard, 1989; Harford, 2005; Cook, 2007). It is therefore not sensible to generate hypotheses about the specific amount of quarters with which changes in acquisitions lag changes in dependent variables. Instead, the lag structure is determined by the data itself, as suggested by Brooks (2008).

The regression model is estimated with a general-to-simple methodology described by Gilbert (1986). The methodology is based on an approach where the researcher originally starts with a large model and then narrows it down by looking for acceptable simplifications. The final model should be *parsimonious*, so that the simplest one of several models with the same explanatory power is selected. The model formulation process of this study starts with a large model including lagged values of each independent variable, with lags ranging from zero to four quarters. The model is then gradually simplified by removing insignificant independent variables, until arriving at a

final model which only contains significant regressors and which is statistically adequate. The final models in this study include each independent variable only once. This was not used as a criterion in model formulation, i.e. the same independent variable could be included in the model several times with different lags. However, the best models in this study emerge when only one lag is included for each variable.

4 Empirical Analysis

This chapter presents the results from empirical analysis. Section 4.1 describes the dependent and independent variables used in the empirical analysis. Section 4.2 presents three models obtained through multiple linear regression, and assesses their adequacy. Section 4.3 returns to the literature based framework developed in Section 2.4, assessing and complementing the model in light of empirical findings.

4.1 Descriptive Analysis

Table 7 displays the key statistical properties of the independent variables, as well as the dependent variables. The properties presented are the number of observations (N), mean, standard deviation (St. dev.), as well as minimum (Min) and maximum (Max) values. Figures plotting each variable against time are presented in Appendix 2.

Table 7: Statistical properties of dependent and independent variables

	N	Mean	St. dev.	Min	Max
Dependent variables					
1 Ln(number of deals announced)	72	4.41	0.32	3.71	5.14
2 Ln(number of cross-currency deals announced)	48	3.12	0.38	2.30	3.85
Independent variables					
1 Difference between ln(stock index) and its trendline	72	0.01	0.31	-0.71	0.76
2 Interest rate	53	4.50	2.61	1.26	15.55
3 First difference of smoothed total demand	72	0.43	1.06	-6.27	1.88
4 Expected improvement in outlook (% of respondents)	72	18.51	9.63	0.95	50.71
5 Expected increase in production (% of respondents)	72	31.76	5.63	16.39	41.01
6 Excess capacity (% of respondents)	72	30.65	17.54	9.19	82.26
7 Exchange rate	48	1.52	0.11	1.19	1.84
8 Inflation	72	1.60	1.16	-0.97	4.60

The sample period consists of 72 quarters ranging from the first quarter of 1992 to the fourth quarter of 2009. As full data availability was used as a selection criterion in the operationalization of variables, 72 observations are available for each variable. As pointed out in Section 3.2.2, the full time period is not used in the case of interest rates and exchange rates, for which reason the sample sizes used for these variables are 53 and 48, respectively.

At 6,273, the absolute value of the minimum of the first difference of smoothed total demand is much higher than its maximum value of 1,877. This is because demand drops strongly in late 2008 and early 2009 due to the economic crisis. The whole set of demand data is nonetheless included in the analysis, because also other variables exhibit clear changes at the time of the economic crisis, including the dependent variable.

The data set includes a total of 6,219 transactions. The first transaction was announced on January 1, 1992, and the last transaction was announced on December 30, 2009. Figure 9 displays the number of transactions announced each year. 2000 is the peak year representing 9.2% of all transactions. The lowest number of transactions was recorded in 2009, which represents 3.4% of the transactions.

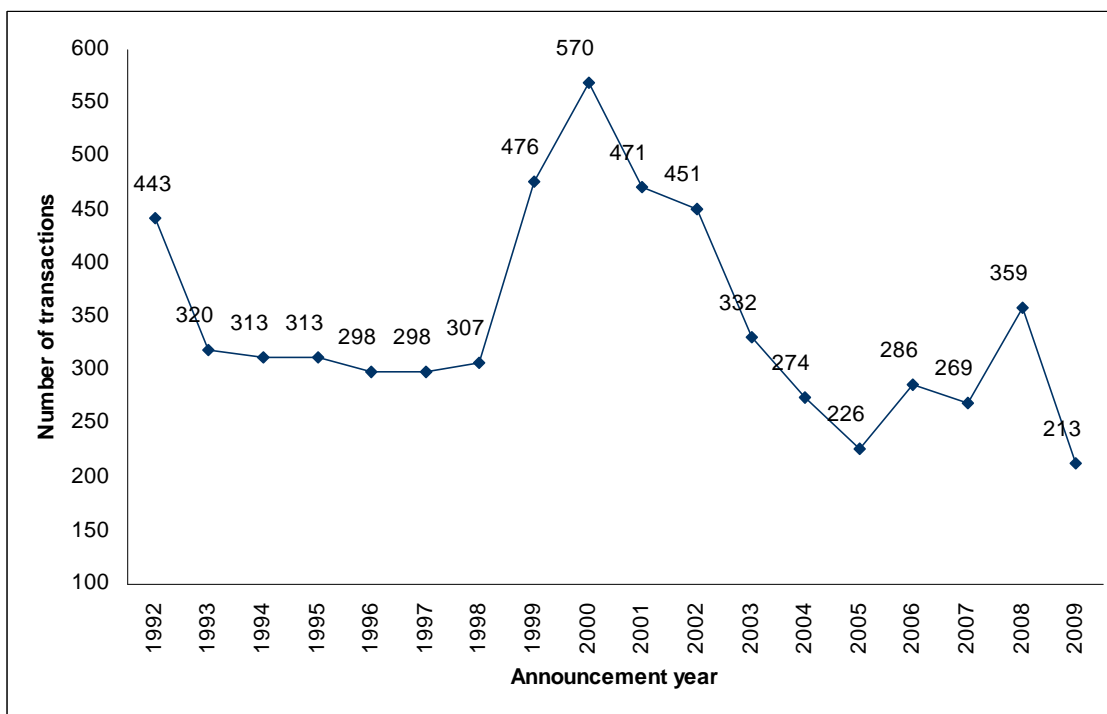


Figure 9: Number of transactions announced each year

Figure 10 shows the quarterly distribution of the transactions. The majority of the transactions were announced in the first and fourth quarters, which represent the winter months from October to March. The lowest number of transactions was announced during the third quarter, from July to September. The number of transactions separately for each quarter is shown in Appendix 1.

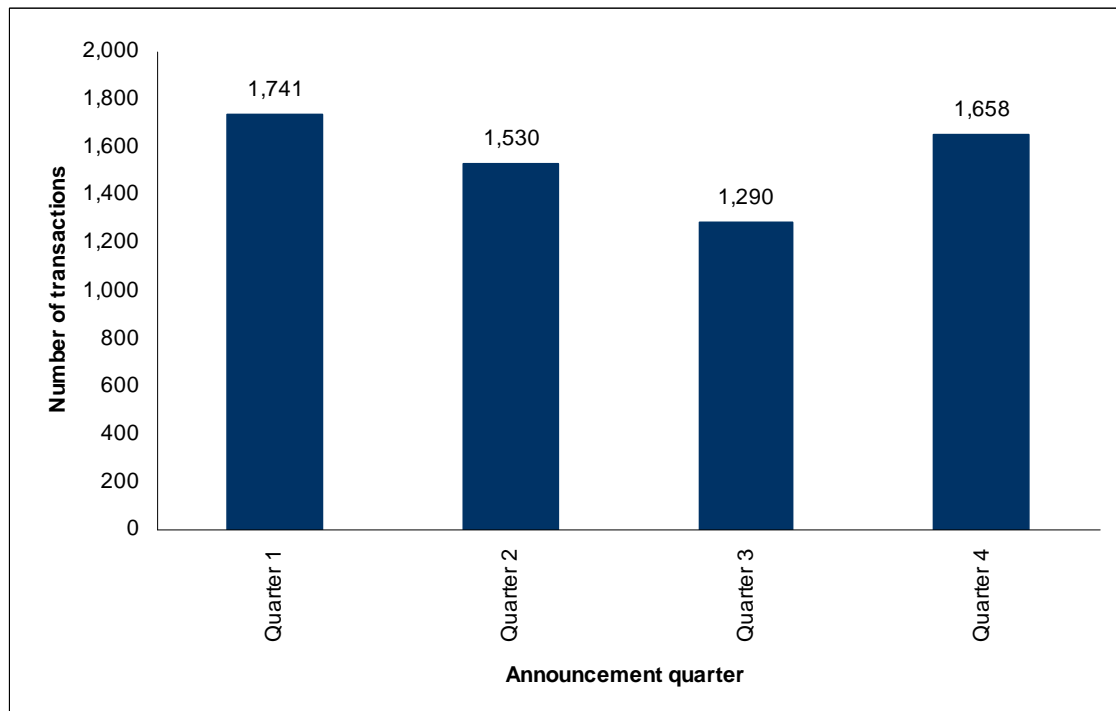


Figure 10: Number of announced transactions by quarter

Table 8 presents a split of the number of transactions in terms of relative nationality and currency of acquirer and target, deal attitude, and acquired stake. 29% of the transactions have a non-Finnish target. The majority of cross-border transactions are cross-currency transactions, which represent 23% of all transactions. Cross-currency transactions are defined in this study as such where the target country's home currency has not been the Finnish mark or the euro at any time point up to the end of the focal time period, i.e. the fourth quarter of 2009.

92% of the transactions are friendly, i.e. recommended by the target's board. Only one transaction is classified by SDC as hostile, meaning that the target's board officially rejected the offer but the acquirer persisted with the takeover. Also, one transaction is classified as unsolicited, which refers to the offer having been a surprise to the target's board and the board not having given a recommendation. The remainder of the transactions are classified as neutral or as such where attitude is not available. Over half of the transactions, 52%, represent the acquisition of a full 100% of the target.

Table 8: Number and share of transactions by relative nationality and currency of acquirer and target, transaction attitude, and acquired stake

Classification	Number of transactions	% of transactions
Domestic target	4,401	71%
Foreign target	1,818	29%
Target with different currency	1,459	23%
Friendly	5,723	92%
Neutral	371	6%
Hostile	1	0%
Unsolicited	1	0%
Attitude not available	123	2%
Acquired 100%	3,239	52%
Acquired 50% or over but less than 100%	619	10%
Acquired less than 50%	772	12%
Stake not available	1,589	26%
Total data set	6,219	100%

As shown in Table 8, 29% of the transactions involve a non-Finnish target. These targets represent 63 different countries from Europe, Asia, Africa, Australia, North America, and South America. The most prominent non-Finnish target country is Sweden, which represents 6% of the transactions. The most common foreign target countries are presented in Figure 11.

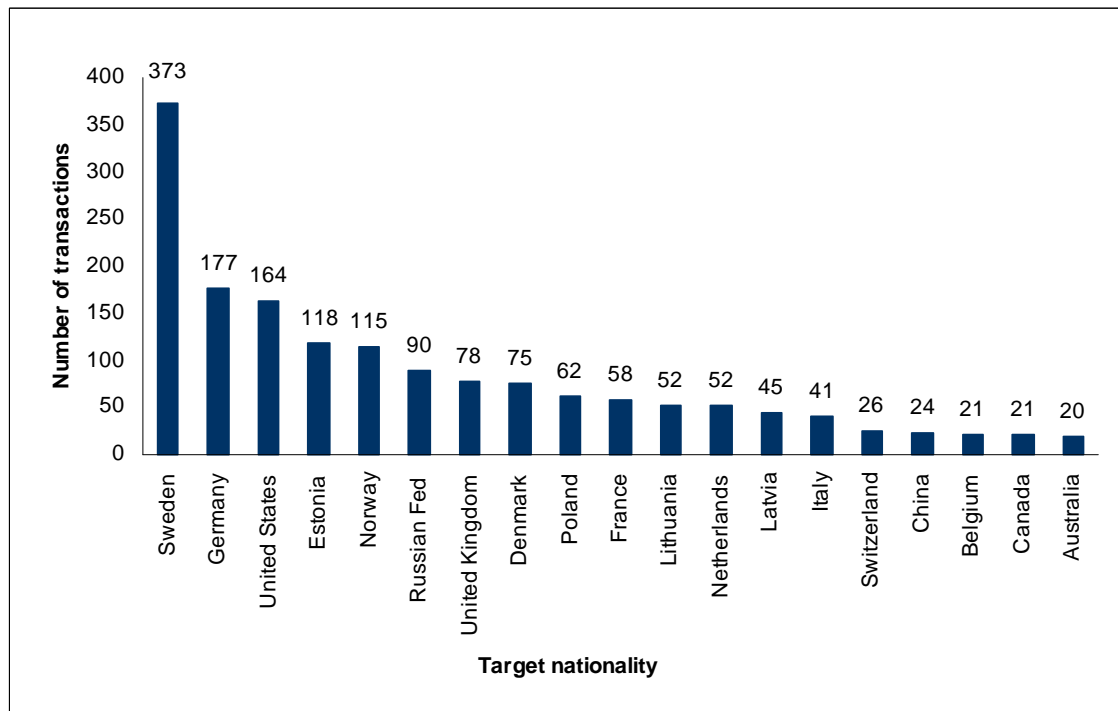


Figure 11: Most common foreign target countries

The acquirers and targets represent 60 different industries. Table 9 shows the number of transactions by industry. Industries which represent over 1% of acquirers, targets, or both, are displayed individually. The remaining industries are aggregated under the item “other industries”.

Table 9: Number and share of transactions by industry, split according to target industry and acquirer industry

Industry	Targets		Acquirers	
	Number	%	Number	%
Business Services	911	14.6%	775	12.5%
Machinery	351	5.6%	332	5.3%
Wholesale Trade - Durable Goods	307	4.9%	196	3.2%
Prepackaged Software	290	4.7%	153	2.5%
Transportation and Shipping (except air)	270	4.3%	222	3.6%
Printing, Publishing, and Allied Services	237	3.8%	277	4.5%
Construction Firms	213	3.4%	162	2.6%
Metal and Metal Products	207	3.3%	180	2.9%
Electric, Gas, and Water Distribution	201	3.2%	187	3.0%
Food and Kindred Products	200	3.2%	215	3.5%
Investment & Commodity Firms, Dealers, Exchanges	196	3.2%	1,079	17.4%
Paper and Allied Products	187	3.0%	179	2.9%
Telecommunications	165	2.7%	181	2.9%
Wood Products, Furniture, and Fixtures	162	2.6%	148	2.4%
Miscellaneous Retail Trade	162	2.6%	89	1.4%
Chemicals and Allied Products	158	2.5%	163	2.6%
Electronic and Electrical Equipment	147	2.4%	114	1.8%
Real Estate; Mortgage Bankers and Brokers	143	2.3%	73	1.2%
Wholesale Trade - Nondurable Goods	139	2.2%	118	1.9%
Commercial Banks, Bank Holding Companies	113	1.8%	160	2.6%
Stone, Clay, Glass, and Concrete Products	105	1.7%	115	1.8%
Measuring, Medical, Photo Equipment; Clocks	95	1.5%	59	0.9%
Insurance	90	1.4%	96	1.5%
Rubber and Miscellaneous Plastic Products	83	1.3%	62	1.0%
Transportation Equipment	76	1.2%	62	1.0%
Hotels and Casinos	74	1.2%	30	0.5%
Textile and Apparel Products	69	1.1%	36	0.6%
Communications Equipment	64	1.0%	113	1.8%
Retail Trade - Food Stores	51	0.8%	74	1.2%
Other industries	753	12.1%	569	9.1%
Total	6,219	100.0%	6,219	100.0%

Business services is the most common target industry, representing circa 15% of all transactions. Business services is also the second most common acquirer industry. The majority of acquirers are from the “investment and commodity firms, dealers and exchanges” sector. They represent mainly investor groups, investment companies, individuals, and venture capital firms, and are therefore untied to any specific industry. Other top industries both in terms of targets and acquirers include machinery, wholesale of durable goods, prepackaged software, transportation and shipping, as well as printing and publishing.

Figure 12 presents the yearly development in acquisition volume for the nine largest industries in terms of target numbers. These nine industries represent 48% of total

transaction volume. The cutoff point for the industries to be presented in Figure 12 was set to target industries which have seen a total of more than 200 transactions. Business services has been the largest industry nearly throughout the focal time period, thereby having a large contribution to aggregate acquisition activity. Most industries exhibit increased acquisition activity during the peaks of the early 2000s and 2008. The peak of 1992, as seen in Figure 9, is also exhibited by Figure 12, although not as clearly as the two other peaks. Three out of the four main contributing industries are included in Figure 12. However the fourth, commercial banks and bank holding companies, is not shown because it exhibits relatively little activity during the remainder of the focal time period. This makes the peak of 1992 less observable in Figure 12.

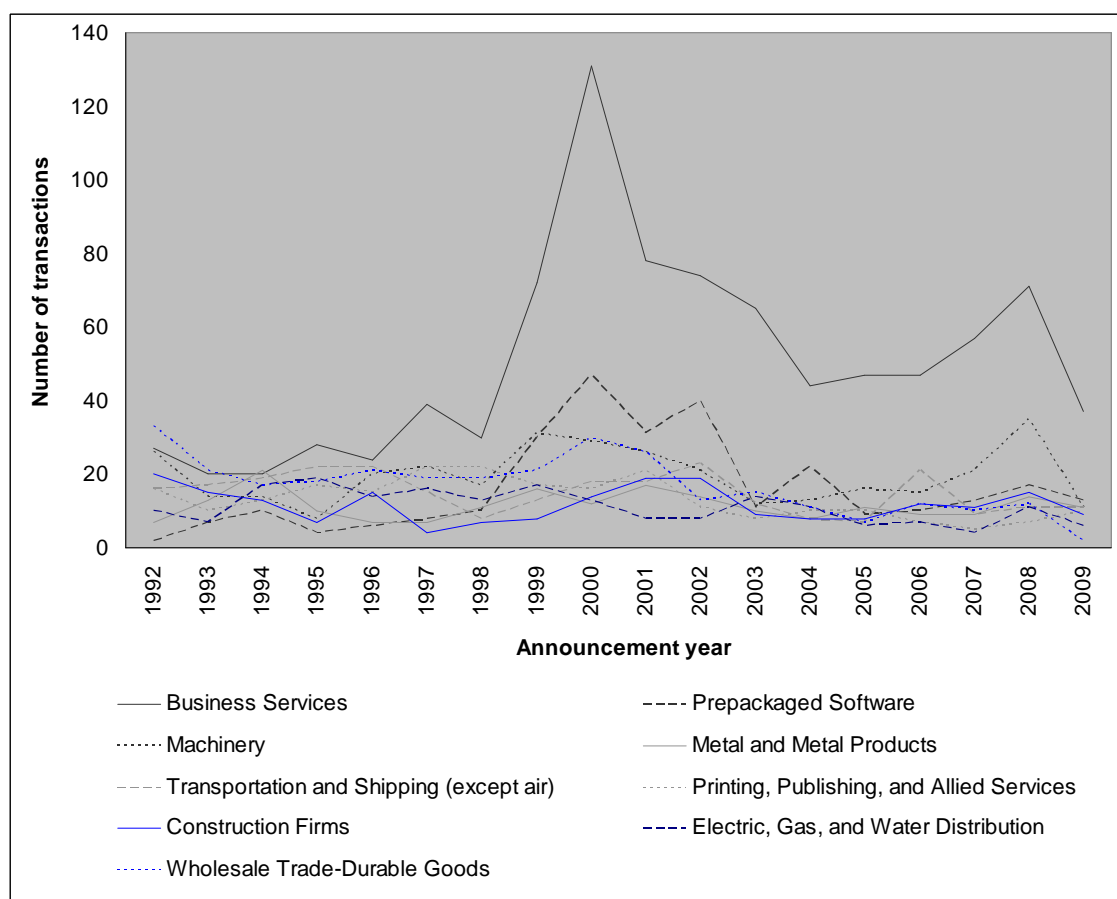


Figure 12: Number of transactions announced each year in the nine most common target industries

The pattern exhibited in Figure 12 is in line with Harford's (2005) research. He finds that although industry level merger waves are caused by different shocks, they are clustered across time to form aggregate waves, due to the effects of macro level factors.

The empirical part of this study focuses on the macro level drivers of these aggregate waves.

Table 10 displays the most frequently occurring combinations of acquirer and target industries. 47% of the transactions are horizontal deals where the acquirer and target represent the same industry. 53% of the transactions involve companies operating in two different industries. Transactions where both the acquirer and target are business service companies are the most common combination, representing 7% of all transactions. The most common cross-industry combination is the acquisition of business service companies by investment and commodity firms, dealers and exchanges, which represents 2% of all transactions.

Table 10: Number and share of transactions for the most frequently occurring combinations of acquirer and target industries

Target industry	Acquirer industry	Number of transactions	% of transactions
Business Services	Business Services	456	7.3%
Transportation and Shipping (except air)	Transportation and Shipping (except air)	185	3.0%
Printing, Publishing, and Allied Services	Printing, Publishing, and Allied Services	182	2.9%
Machinery	Machinery	176	2.8%
Food and Kindred Products	Food and Kindred Products	152	2.4%
Electric, Gas, and Water Distribution	Electric, Gas, and Water Distribution	145	2.3%
Business Services	Investment & Commodity Firms, Dealers, Exchanges	128	2.1%
Prepackaged Software	Business Services	104	1.7%
Paper and Allied Products	Paper and Allied Products	95	1.5%
Telecommunications	Telecommunications	94	1.5%
Chemicals and Allied Products	Chemicals and Allied Products	91	1.5%
Investment & Commodity Firms, Dealers, Exchanges	Investment & Commodity Firms, Dealers, Exchanges	91	1.5%
Prepackaged Software	Prepackaged Software	85	1.4%
Wholesale Trade - Durable Goods	Wholesale Trade - Durable Goods	83	1.3%
Metal and Metal Products	Metal and Metal Products	81	1.3%
Construction Firms	Construction Firms	75	1.2%
Wood Products, Furniture, and Fixtures	Wood Products, Furniture, and Fixtures	74	1.2%
Commercial Banks, Bank Holding Companies	Commercial Banks, Bank Holding Companies	73	1.2%
Miscellaneous Retail Trade	Miscellaneous Retail Trade	63	1.0%
Real Estate; Mortgage Bankers and Brokers	Investment & Commodity Firms, Dealers, Exchanges	61	1.0%
Insurance	Insurance	59	0.9%
Electronic and Electrical Equipment	Electronic and Electrical Equipment	58	0.9%
Stone, Clay, Glass, and Concrete Products	Stone, Clay, Glass, and Concrete Products	57	0.9%
Machinery	Investment & Commodity Firms, Dealers, Exchanges	55	0.9%
Wholesale Trade - Nondurable Goods	Wholesale Trade - Nondurable Goods	53	0.9%

4.2 Regression Analysis

4.2.1 Regression Models

Three separate regression models are built in this study in order to (1) analyze the entire focal time period, (2) include variables that have undergone a structural change during that time period, and (3) analyze the effect of exchange rates on cross-currency transactions. The first two models take the natural logarithm of the total number of transactions as their dependent variable. Because cross-currency transactions only represent 23% of all transactions, exchange rates are not included as an independent variable in these models. The third model takes the natural logarithm of the number of cross-currency transactions as its dependent variable, which allows for the inclusion of exchange rates as an independent variable.

The first model uses data from the entire focal time period ranging from the first quarter of 1992 to the last quarter of 2009. Because the Finnish monetary environment underwent a step change in the mid-1990s, the first model does not include interest rates in the set of independent variables. The second model includes the same variables as the first model, as well as interest rates. It is based on data starting from the fourth quarter of 1996, when Finland joined the European Exchange Rate Mechanism. The third model takes the natural logarithm of the number of cross-currency transactions as its dependent variable. Similarly as in Model 2, the time period of the third model begins from the fourth quarter of 1996. Table 11 presents the regression results for the three models. It shows the dependent variable, sample time period, and number of quarters in the sample for each model. It also presents the goodness of fit statistics of each model in terms of R^2 and adjusted R^2 . The table presents unstandardized regression coefficients for each independent variable and model, where applicable. Their statistical significance at 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively. Standard errors are presented in parentheses beneath each coefficient. Table 11 also presents the lag in quarters at which each independent variable is included in the models. Although there are three separate models, lags are presented only once for each independent variable, because each variable's lag remains the same across models. The expected sign shows the sign of the coefficient predicted by the operationalized hypotheses. Due to a lack of previous research, the operationalized hypothesis 8 does not contain a prediction about

the sign of the relationship between inflation and acquisition activity, and hence Table 11 does not present an expected sign for inflation.

Table 11: Results of regression analysis

	Lag	Expected sign	Model 1 (entire time period)	Model 2 (including interest rates)	Model 3 (including interest and exchange rates)
Dependent variable			Ln(number of transactions)	Ln(number of transactions)	Ln(number of cross-currency transactions)
Time period			1992Q1 to 2009Q4	1996Q4 to 2009Q4	1996Q4 to 2009Q4
Number of quarters			72	53	53
R ²			0.748	0.791	0.675
Adjusted R ²			0.711	0.741	0.588
F-test statistic			20.4	15.9	7.7
Constant			2.732*** (0.263)	2.897*** (0.389)	-2.125 (1.655)
Dummy for Q1		+	0.147** (0.059)	0.037 (0.078)	-0.010 (0.112)
Dummy for Q2		+	0.085 (0.058)	0.033 (0.071)	0.100 (0.102)
Dummy for Q4		+	0.227*** (0.057)	0.189*** (0.070)	0.160 (0.100)
Ln(share index) - trendline	4Q	+	0.610*** (0.112)	0.835*** (0.206)	1.153*** (0.330)
Interest rate	4Q	-		-0.094** (0.045)	-0.120* (0.067)
First difference of demand	1Q	+	0.068** (0.026)	0.086** (0.032)	0.055 (0.047)
Expected cycle outlook improvement	0Q	+	0.012*** (0.002)	0.021*** (0.004)	0.007 (0.006)
Expected production increase	2Q	+	0.024*** (0.007)	0.018* (0.009)	0.013 (0.014)
Excess capacity	1Q	+	0.013*** (0.002)	0.021*** (0.004)	0.007 (0.007)
Exchange rate (FIM to SEK)	4Q	+			2.990*** (1.005)
Inflation	0Q		0.058** (0.022)	0.118*** (0.036)	0.101* (0.057)

The portion of variability explained by the explanatory variables, or R², is 0.748, 0.791, and 0.675 for models 1, 2, and 3, respectively. Hence, the models explain from 75% up to 79% of the variability in acquisition activity. The values of the adjusted R² statistic

are not much lower, at 0.711, 0.741, and 0.588. F-test statistic values are 20.4, 15.9, and 7.7 for models 1, 2, and 3, respectively. The corresponding critical values are 2.03, 2.06, and 2.03, and hence the F-test results strongly indicate that the independent variables do have an effect on the dependent variable in each model.

The signs of all variables are as expected. As acquisition activity is typically at its lowest in the third quarter, the coefficients of the dummy variables for the first, second, and fourth quarters are positive. The dummy coefficients indicate the average deviation of the natural logarithm of the number of transactions in quarters 1, 2, and 4 from its value in quarter 3. Interest rates exhibit a negative sign, as expected. Inflation turns out to have a positive sign, indicating that high inflation positively affects acquisition activity. Also all other explanatory variables have a positive sign, as expected.

All except three independent variables are significant at 1% or 5% level. Expected production increase in Model 2 is shown in Table 11 to be significant only at the 10% level. Its p value is 0.07, hence the exact significance is still closer to 5% than to 10%. Interest rates and inflation in Model 3 are also significant at the 10% level, both with a p value of 0.08.

Figure 13, Figure 14, and Figure 15 illustrate the variables of the three regression models, along with their lags and the signs of their effects. The vertical dotted line at which each variable box begins indicates the lag of the variable. Only variables that are significant at 0.01, 0.05, or 0.1 levels are shown in the figures.

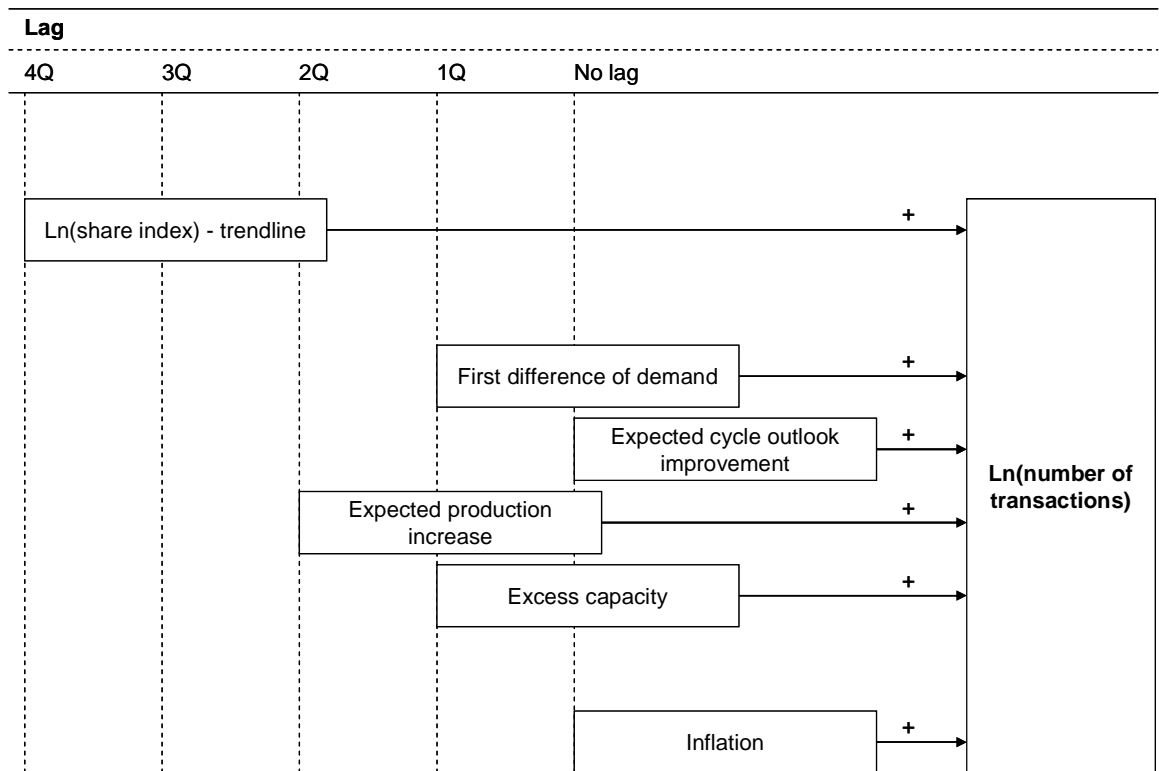


Figure 13: Graphical illustration of Model 1

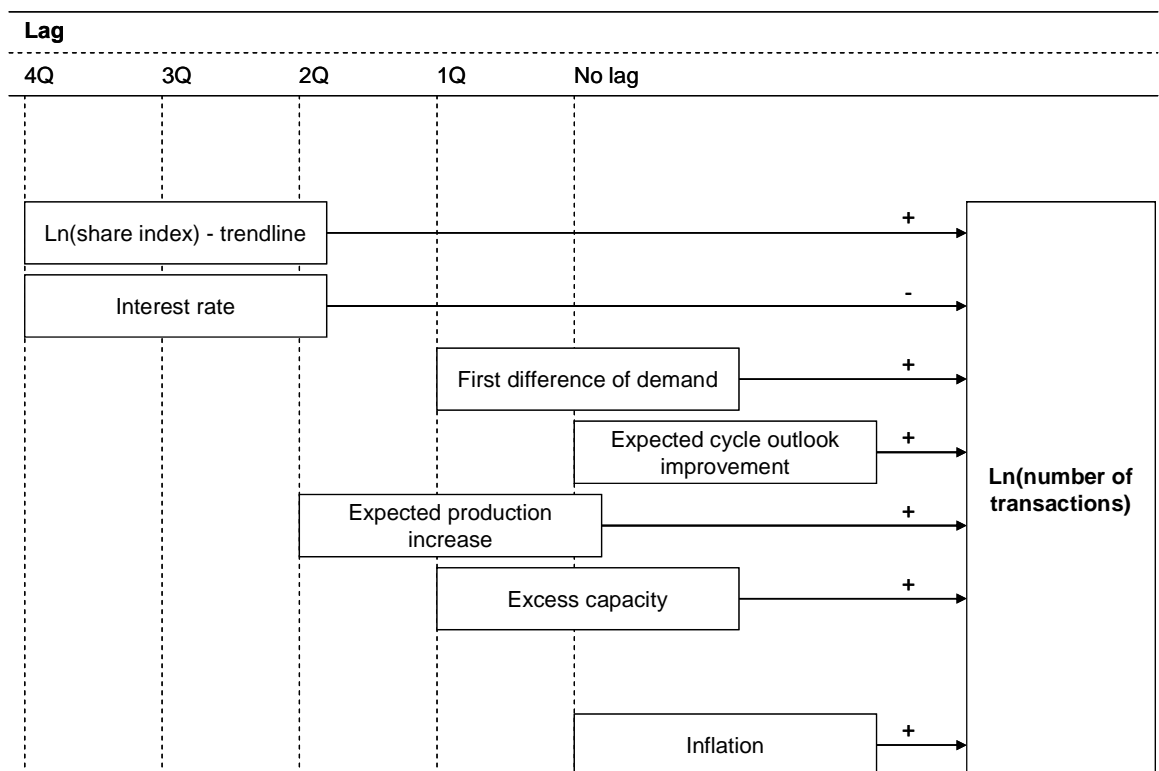
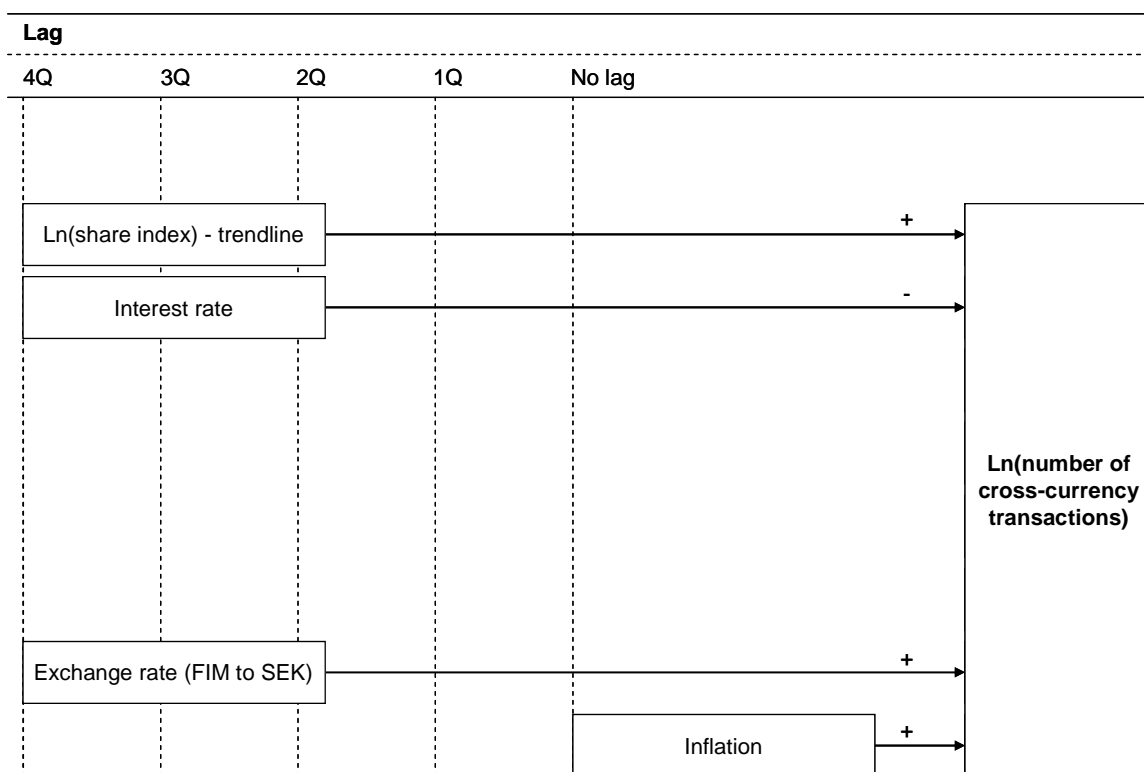


Figure 14: Graphical illustration of Model 2



The dependent variable of Model 3 only includes cross-currency transactions. Unlike Model 1, Model 3 includes interest rates and exchange rates. However, demand, cycle outlook, production, and capacity are not significant in Model 3.

4.2.2 Adequacy of Models

Assumptions underlying linear regression

As described in Section 3.4.2, the four main assumptions underlying linear regression are (1) zero expected value of the error terms, (2) constant variance of the error terms, (3) zero correlation between the error terms, and (4) normality of the error term distribution.

Table 12 presents test results for each of the assumptions. All tests were performed at a 5% level of significance. The first assumption holds, as the average of error terms is zero for each model. The second assumption holds, as indicated by the Goldfeld-Quandt test; the null hypothesis of the error terms having a constant variance is not rejected. The third assumption holds, as indicated by the Breusch-Godfrey test; the null hypothesis of no autocorrelation between any error term and its four lagged values is not rejected. The fourth assumption of normally distributed error terms also holds, as indicated by the Bera-Jarque test.

Table 12: Test results for basic assumptions of linear regression

Assumption and conclusion	Test	Null hypothesis	Critical value at 5% level of significance	Test statistic	p value
(1) $E(u_t) = 0$	n/a	n/a	n/a	n/a	n/a
<i>Average value of error terms is zero for each model.</i>					
(2) $\text{Var}(u_t) = \sigma^2$	Goldfeld-Quandt	$\sigma_1^2 = \sigma_2^2$			
Model 1			1.93	1.13	0.38
Model 2			2.35	0.76	0.70
Model 3			2.42	1.90	0.11
<i>Null hypothesis of constant variance of error terms not rejected for any model.</i>					
(3) $\text{Cov}(u_i, u_j) \neq 0$	Breusch-Godfrey	$\rho_1 = \rho_2 = \rho_3 = \rho_4 = 0$			
Model 1			9.49	7.62	0.11
Model 2			9.49	7.06	0.13
Model 3			9.49	6.37	0.17
<i>Null hypothesis of no relationship between residuals not rejected for any model.</i>					
(4) $u_t \sim N(0, \sigma^2)$	Bera-Jarque	Error term distribution is symmetric and mesokurtic			
Model 1			5.99	0.24	0.89
Model 2			5.99	1.64	0.44
Model 3			5.99	1.41	0.49
<i>Null hypothesis of normally distributed error terms not rejected for any model.</i>					

In addition to the tests presented in Table 12, heteroskedasticity and autocorrelation can be inspected visually. Heteroskedasticity was assessed by plotting unstandardized residuals against time and against each independent variable, separately for each model. The resulting scatter plots do not exhibit any discernible pattern, indicating that the errors are homoskedastic. Figure 16 presents an example of such a scatter plot, showing unstandardized residuals plotted against time for Model 1. The variance of the residuals does not appear to increase or decrease with time.

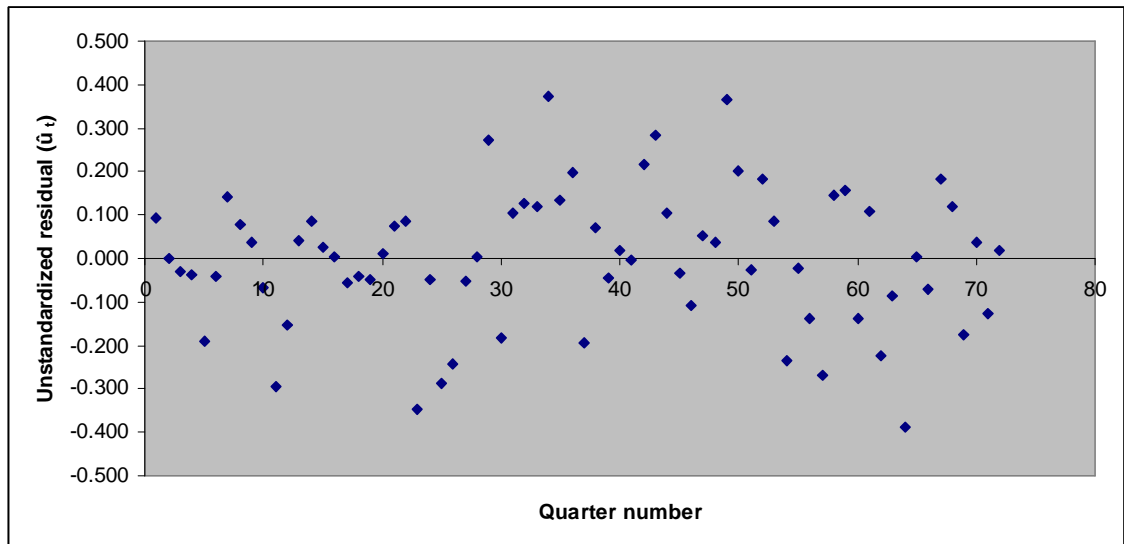


Figure 16: Plot of unstandardized residuals against time for Model 1

Autocorrelation was visually assessed by plotting unstandardized error terms against their lagged values, separately for each model and each lag. The resulting scatter plots do not exhibit any clear patterns, indicating that the error terms are not autocorrelated. Figure 17 presents an example of such a scatter plot, showing unstandardized error terms of Model 2 plotted against their values lagged with one quarter. No pattern can be detected in the plot.

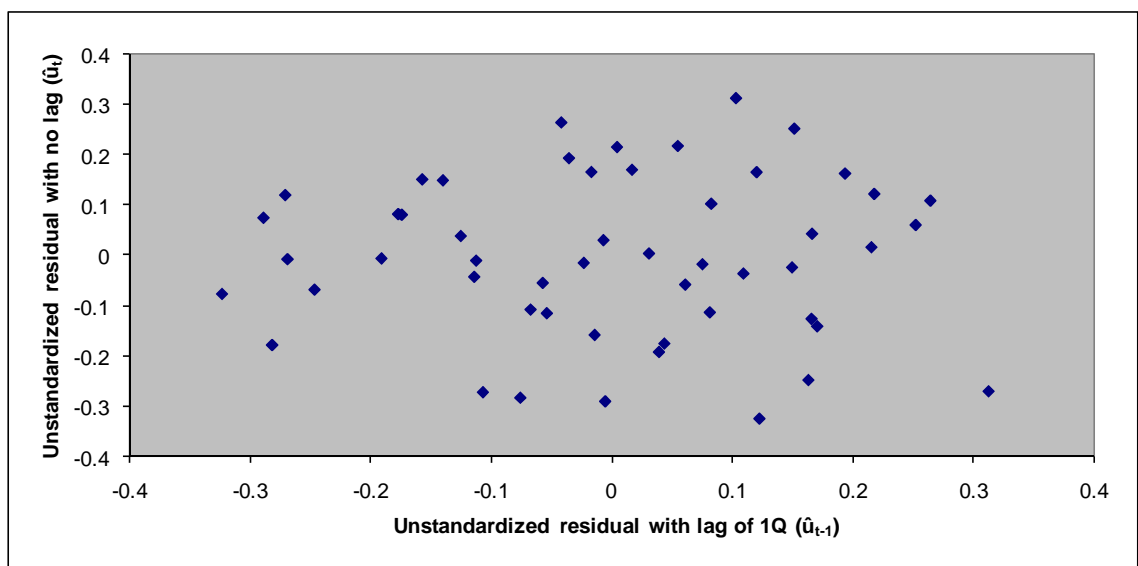


Figure 17: Plot of unstandardized residuals \hat{u}_t against \hat{u}_{t-1} for Model 2

In addition to visual inspection and the Breusch-Godfrey test, autocorrelation was tested by performing the Durbin-Watson test for each model. The results of the Durbin-Watson test are presented in Table 13. dL and dU represent the lower and upper critical values of the Durbin-Watson statistic. The test statistic of Model 1 falls between the lower and upper values, leaving the test inconclusive for Model 1. For models 2 and 3, the test statistic is higher than the upper critical value dU, but lower than $(4-dU)$, indicating that there is no evidence of positive or negative autocorrelation of consecutive error terms.

Table 13: Durbin-Watson test results for autocorrelation

	dL	dU	Durbin-Watson test statistic	Conclusion
Model 1	1.206	1.752	1.593	<i>Inconclusive</i>
Model 2	0.993	1.848	1.997	<i>No evidence of autocorrelation</i>
Model 3	0.953	1.945	2.058	<i>No evidence of autocorrelation</i>

Multicollinearity

In addition to the basic assumptions tested above, it is important that the explanatory variables are not too highly correlated with each other. The variance inflation factors of explanatory variables are presented in Table 14. The factors indicate that multicollinearity is not an issue in the models. Most values are below 5, and all values are clearly below 10, which can be considered acceptable.

Table 14: Variance inflation factors for assessment of multicollinearity

	Variance inflation factor		
	Model 1	Model 2	Model 3
Dummy for Q1	1.627	1.942	1.628
Dummy for Q2	1.553	1.615	6.475
Dummy for Q4	1.519	1.627	2.691
Ln(share index) - trendline	2.578	5.157	6.588
Interest rate		3.111	4.187
First difference of demand	1.892	2.615	2.691
Expected cycle outlook improvement	1.274	1.505	1.565
Expected production increase	3.695	4.087	4.125
Excess capacity	3.178	5.413	4.125
Exchange rate (FIM to SEK)			3.358
Inflation	1.634	3.329	1.565

Parameter stability

Parameter stability of each of the three models was tested with the Chow test. In order to perform the test, the data was split into two sub-periods of similar sizes. Table 15 presents the sub-periods, critical values at 5% and 1% levels of significance, Chow test statistics, and p values for each model.

Table 15: Chow test results for parameter stability

	Model 1	Model 2	Model 3
Whole period	1992Q1 to 2009Q4	1996Q4 to 2009Q4	1996Q4 to 2009Q4
Sub-period 1	1992Q1 to 2000Q4	1996Q4 to 2003Q1	1996Q4 to 2003Q1
Sub-period 2	2001Q1 to 2009Q4	2003Q2 to 2009Q4	2003Q2 to 2009Q4
Critical value (5%)	2.02	2.11	2.10
Critical value (1%)	2.68	2.88	2.87
Chow test statistic	1.28	0.44	1.02
p value	0.26	0.92	0.45

Test results show that the null hypothesis of parameters being stable over time is not rejected at 5% or 1% levels of significance for any model.

Stationarity

For the estimated models to be statistically adequate, the variables in the models should be stationary. The Dickey-Fuller test was performed for each variable to test for stationarity. The error terms of the estimated regression in the Dickey-Fuller test were tested for autocorrelation with the Breusch-Godfrey test. If the null hypothesis of no autocorrelation was rejected, the augmented Dickey-Fuller test was used to test for stationarity.

Visual inspection of the variable plots in Appendix 2 reveals that none of the variables used in the regression models are growing, or decreasing, over time. While variables such as stock market indices and demand do grow over time, the transformations used in this study do not do so. Therefore the Dickey-Fuller test equations do not include a trend, however they include a constant (Elder and Kennedy, 2001).

Table 16 presents the results of stationarity tests for all variables. The critical values of the Dickey-Fuller test statistic at 5% and 10% levels of significance are shown at the top. Table 16 shows the Dickey-Fuller test statistic for variables whose error terms from the Dickey-Fuller test regression are not autocorrelated, and the augmented Dickey-Fuller test statistic for variables whose error terms exhibit autocorrelation. Whenever the test statistic is more negative than the critical value, the null hypothesis of a unit root is rejected in favor of the alternative hypothesis of stationarity.

Table 16: Results of Dickey-Fuller tests for stationarity

Level of significance		5%	10%		
Critical value of Dickey-Fuller test statistic		-2.86	-2.57		
	Autocorrelation of error terms according to Breusch-Godfrey?	Dickey-Fuller test statistic	Augmented Dickey-Fuller test statistic	Null hypothesis of unit root rejected in favor of stationarity?	
				5% level of significance	10% level of significance
Ln(number of transactions)	No autocorrelation	-3.91		Yes	Yes
Ln(number of cross-currency transactions)	No autocorrelation	-3.25		Yes	Yes
Ln(share index) - trendline	Autocorrelation		-2.65	No	Yes
Interest rate	No autocorrelation	-2.58		No	Yes
First difference of demand	No autocorrelation	-4.67		Yes	Yes
Expected cycle outlook improvement	No autocorrelation	-3.34		Yes	Yes
Expected production increase	Autocorrelation		-2.31	No	No
Excess capacity	Autocorrelation		-3.00	Yes	Yes
Exchange rate (FIM to SEK)	No autocorrelation	-2.52		No	No
Inflation	Autocorrelation		-2.98	Yes	Yes

The dependent variables are stationary at a 5% significance level. Also demand, cycle outlook, excess capacity, and inflation are stationary at a 5% significance level. Share index performance and interest rates are stationary at a 10% significance level.

The variable that represents the four-quarter moving average of the percentage of answers showing an expected increase in production in the next 3 months is not stationary according to the Dickey-Fuller test. Also the KPSS test calls for the rejection of a null hypothesis of stationarity. Visual inspection of the time series presenting the moving average of answers anticipating a production increase, presented in Appendix 2, suggests that the series does not contain an upward trend. Also, the other two time series extracted from the business tendency surveys conducted by the Confederation of Finnish Industries, cycle outlook and excess capacity, are stationary according to the Dickey-Fuller test. Hence, the actual time series population may well not be non-stationary, even though the selected sample so indicates.

The test statistic level for the exchange rate of the Finnish mark to the Swedish crown is -2.52, whereas the critical value at a 10% significance level is -2.57. While the Dickey-Fuller test does not allow for the rejection of the null hypothesis of stationarity, the test statistic is very close to the critical value. The KPSS test calls for the rejection of a null hypothesis of stationarity.

All in all, the stationarity tests indicate that two of the independent variables may not be stationary. The first variable, expected production increase, is included in models 1 and 2. The second variable, exchange rates, is only included in Model 3. Hence, each model only includes one variable with possible non-stationarity issues. Spurious regressions are not a risk because all other except possibly one variable are stationary, and most importantly, the dependent variables are stationary.

4.2.3 Summary of Results

Table 17 summarizes the operationalized hypotheses developed in Section 3.3 and the results of quantitative analysis. Empirical findings support each hypothesis. Hypothesis 8, which does not take a stand on the type of relationship between inflation and acquisition activity, is supported, and regression results indicate that the relationship is positive.

Table 17: Summary of operationalized hypotheses and results

Operationalized hypothesis	Relevant variable	Effect on acquisition activity indicated by regression analysis
1. Stock market performance is positively related to the number of acquisitions	Difference between the natural logarithm of the weight capped all-share index of the Helsinki Stock Exchange and its trendline	Positive and significant at 1% level in models 1, 2 and 3
2. Interest rates are negatively related to the number of acquisitions	12-month interbank interest rates	Negative and significant at 5% level in Model 2 and at 1% level in Model 3
3. Total demand is positively related to the number of acquisitions	First difference of seasonally smoothed total demand	Positive and significant at 5% level in models 1 and 2
4. Expected improvement in the business outlook is positively related to the number of acquisitions	Percentage of respondents stating that they expect the business outlook to improve	Positive and significant at 1% level in models 1 and 2
5. Increasing production is positively related to the number of acquisitions	Percentage of respondents stating that they expect production to increase in the next three months	Positive and significant at 1% level in models 1 and 2
6. Excess capacity is positively related to the number of acquisitions	Percentage of respondents stating that they have excess capacity	Positive and significant at 1% level in models 1 and 2
7. Strong exchange rate of the currency in the acquirer's country relative to other countries is positively related to the number of acquisitions from that country into other countries	Exchange rate of the Swedish crown against the Finnish mark	Positive and significant at 1% level in Model 3
8. Inflation is related to the number of acquisitions	Inflation	Positive and significant at 5% level in Model 1, 1% level in Model 2, and 10% level in Model 3

4.3 Literature Based Framework Augmented with Empirical Findings

The literature based framework developed in Chapter 2 displays micro, industry, and macro level drivers of acquisition activity, as presented in existing literature. The model splits macro level drivers into quantitative and qualitative drivers.

Figure 18 presents the literature based framework augmented with results from empirical analysis for quantitative macro level drivers. Each driver originally presented in the literature based framework is supported by empirical findings. The variables selected to represent each driver in this study are presented in italics. The sign of the effect is presented on the right-hand side of each driver.

In addition to the seven drivers identified in literature, *inflation* has been added to the model as an eighth quantitative macro level driver. Inflation was shown to have a significant positive effect on acquisition activity in each of the three regression models developed. As can be observed from Figure 13, Figure 14, and Figure 15, each variable exhibits the same lag in each of the three models where it is included.

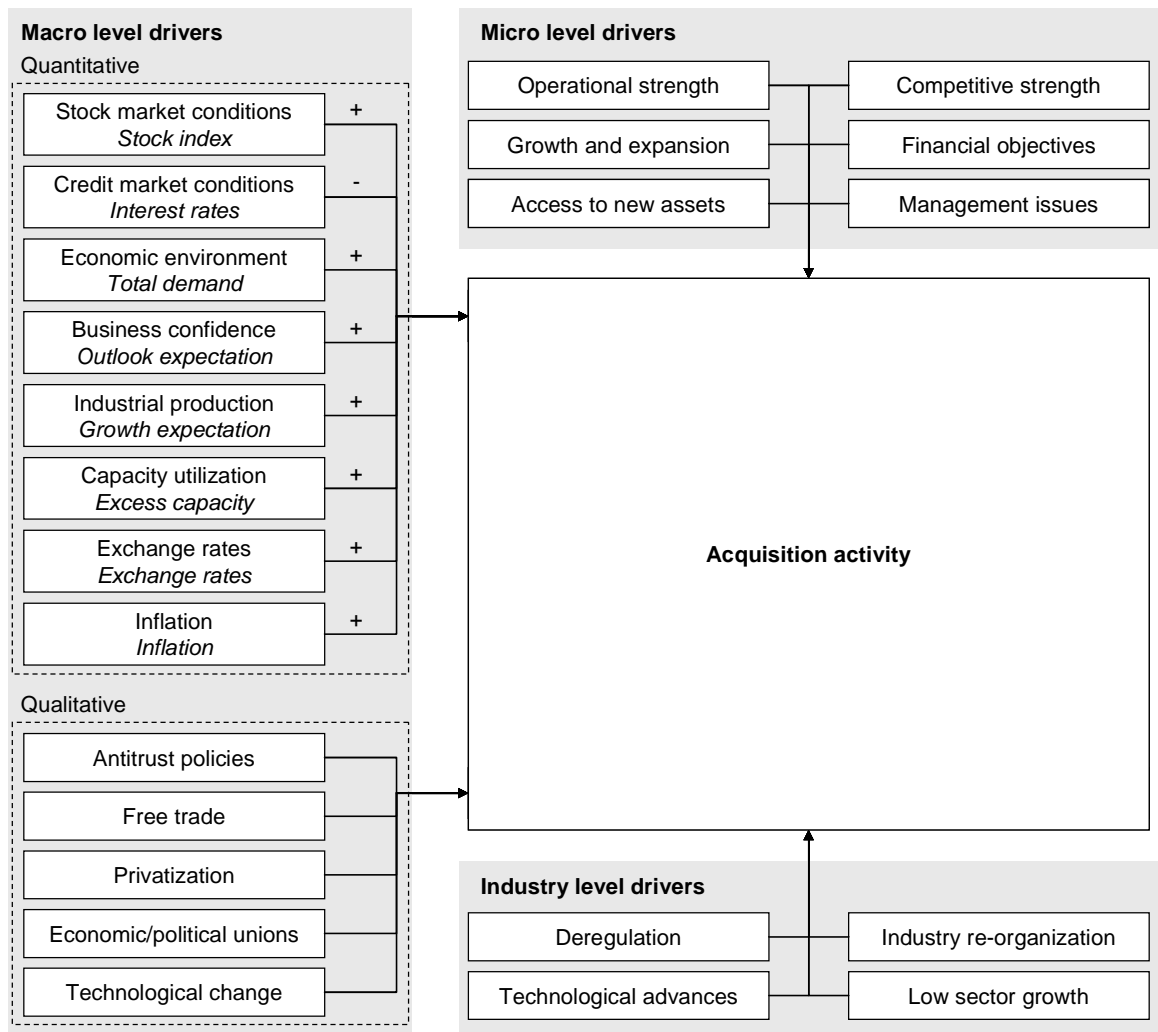


Figure 18: Literature based framework augmented with empirical findings

Figure 19 presents the quantitative macro level drivers of the augmented framework, adding the empirically observed lag between each driver and acquisition activity.

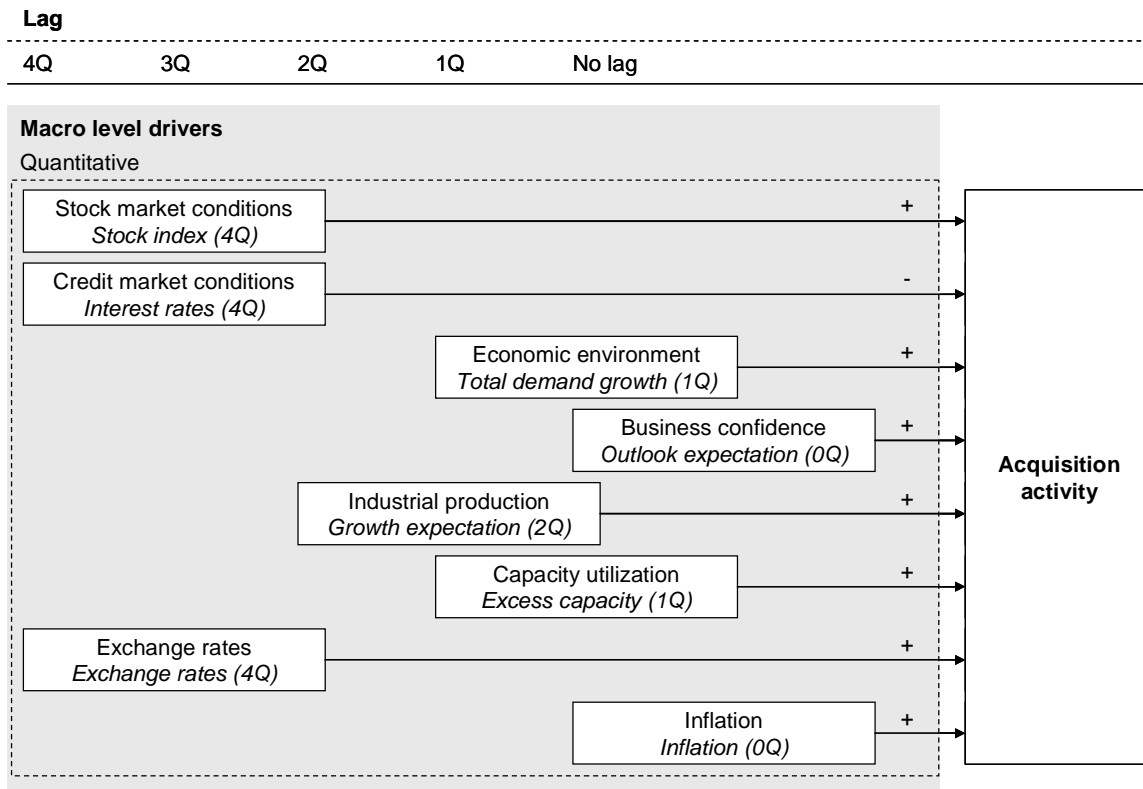


Figure 19: Quantitative macro level drivers of acquisition activity

The effects of stock market conditions, credit market conditions, and exchange rates on acquisition activity are strongest with a lag of four quarters. Hence, an increase in stock indices, a decrease in interest rates, or the strengthening of a currency can be expected to lead to an increase in acquisition activity in one year's time.

Figure 19 shows that production growth expectations affect acquisition activity with a lag of two quarters. As presented in Table 6, the specific variable used in the empirical analysis to represent industrial production is the *backward-looking four-quarter moving average of the share of respondents who state that they expect production to increase in the next three months*. This implies that expectations of production growth have a positive impact on acquisition activity with a time span ranging from a year and a half to half a year.

Quarter-on-quarter growth in total demand and excess capacity are shown by the empirical findings to be leading indicators of acquisition activity with a lag of one quarter.

Finally, an increase in acquisition activity coincides with periods when the business outlook is expected to improve and when inflation is high. The empirical results presented above are further discussed and assessed in Chapter 5.

5 Discussion

This chapter discusses the results of the study. Section 5.1 presents conclusions based on findings from the literature review and empirical analysis. It provides a summary of the dynamics through which quantitative macro level drivers affect acquisition activity. Section 5.2 provides an assessment of the results. Section 5.3 concludes this chapter with suggestions for further research.

5.1 Conclusions

As shown in Figure 19, three drivers precede acquisition announcements by four quarters. Strong stock market conditions can lead to high acquisition activity because they improve acquirers' financing ability through high valuations. Optimism and an action-oriented mindset prevalent during strong stock market conditions can also have a positive effect on acquisition activity. Low interest rates have a positive effect on acquisition activity, as they improve companies' financing ability through cheaper funds. Much like high stock valuations and low interest rates, strength of the acquirer's currency also positively affects acquisitions in the case of cross-currency transactions, as it increases transactions' financial attractiveness.

Expectations of growth in industrial production precede acquisition activity by two quarters. As shown in Table 6, expectations refer to what respondents anticipate to happen in the coming three months. Hence, assuming that respondents' expectations are generally correct, production increases approximately one quarter before acquisition activity picks up.

Growth in total demand precedes acquisition activity by one quarter. Growing demand can cast a more positive outlook on targets' performance, making acquisitions more appealing. Also, companies may seek to respond to increasing demand by growing in size, which can be done fully or partially through expansionary acquisitions. Production growth also precedes acquisitions by one quarter. This can imply that companies quickly respond to growing demand by increasing their production.

Debate exists in literature about the relationship between capacity utilization and acquisition activity. Some researchers view that high capacity utilization leads to acquisitions, as companies need quick access to additional capacity (Komlenovic,

Mamun and Mishra, 2009). Others suggest that low capacity utilization drives acquisitions, as consolidation is an efficient means of reducing excess capacity (Jensen, 1993). The results of this study support the latter view, as each of the three models developed shows a significant positive relationship between excess capacity and acquisition activity, with excess capacity preceding acquisition activity by one quarter. As shown in Figure 19 increasing demand, growth in production, and excess capacity all precede acquisition activity by one quarter. The underlying logic can be based on the assumption that although production and demand are growing, they have not yet reached their peak, and hence capacity is not yet utilized to the fullest. In such circumstances companies may prepare for full capacity utilization, or even lack of sufficient capacity, by deciding to acquire. It may also be that while demand and production are growing in the economy overall, certain industries suffer from low demand and excess capacity. This situation may lead to acquisitions taking place in the economy overall as well as in certain low-performing industries, although for two different reasons.

Expectations of an improvement in the business outlook coincide with acquisition announcements. Companies are more likely to make acquisitions at times when they foresee improvements in the business cycle. Similarly, if companies expect business to deteriorate, they are more likely to refrain from acquisitions. This implies that acquisitions are more prevalent in upturns than in downturns.

Inflation was not found in the literature review to have been identified as a driver of acquisition activity in previous research. However, empirical analysis found inflation to have a positive significant relationship with the number of acquisitions, with no lag.

The positive relationship between inflation and acquisition activity may be related to interest rates in two ways. High inflation makes it less attractive to hold monetary assets over real assets, on one hand, and creates opportunities for less expensive acquisition financing, on the other.

High inflation encourages investment in real assets, as inflation lowers the return on monetary assets relative to real assets. Hence, at periods of high inflation, companies prefer to invest in non-monetary assets which they can obtain through, among other means, acquisitions. Switching from holding their assets as money or other inflation sensitive assets, to investing in real assets enables companies to reduce their exposure to the decreasing purchasing power of money. Therefore, performing acquisitions during

periods of high inflation may enable companies to mitigate the negative effects of inflation.

The regression results show that acquisition activity is negatively related to nominal interest rates with a lag of four quarters. Rising inflation makes real interest rates lower. Hence it is possible that when companies find themselves in an environment of high inflation, they are further incentivized to acquire, as low real interest rates bring down the cost of financing acquisitions.

Credit availability was identified in the literature review as a potential driver of acquisition activity. However, credit availability was not included in the empirical models due to limitations set by variable operationalization. Boschi and Girardi (2007) point out that high inflation is positively related to high credit availability. Hence the observation that acquisition activity coincides with high inflation may be an indication of acquisition activity typically being higher when there is an abundance of credit available to finance acquisitions.

Finally, it should be noted that the finding that inflation coincides with acquisition activity can also be partially caused by changes in the explanatory variable representing interest rates. Models 2 and 3 show that changes in interest rates precede changes in acquisition activity by four quarters. Koedijk, Kool and Kroes (1994) show a significant relationship between interest rates and expected inflation rates. Assuming that expected inflation rates predict sufficiently well realized inflation rates, this would imply that inflation rates depend on interest rates with a lag. Although interest rates and inflation are both explanatory variables in models 2 and 3, the potential aforementioned relationship between them does not cause the regression estimates to be unreliable, as shown by the assessment of multicollinearity in Section 4.2.2.

Figure 20 recapitulates the above discussion of quantitative macro level drivers of acquisition activity. Most of the drivers are part of three broader categories. *Good financing ability* consists of high stock prices, low interest rates, and a strong currency of the acquirer. Drivers that infer good financing ability precede acquisition announcements by four quarters. *Growing demand in the economy* is represented by growth in total demand and growth in production. Assuming that expectations of production growth in the coming three months are generally correct, both indicators of growing demand in the economy precede acquisition announcements by one quarter. Also excess capacity is a leading indicator of acquisition activity with a lag of one

quarter. Finally, a *positive overall sentiment in the economy*, as indicated by a positive business outlook, coincides with acquisition announcements. High inflation can also be observed simultaneously with high acquisition activity.

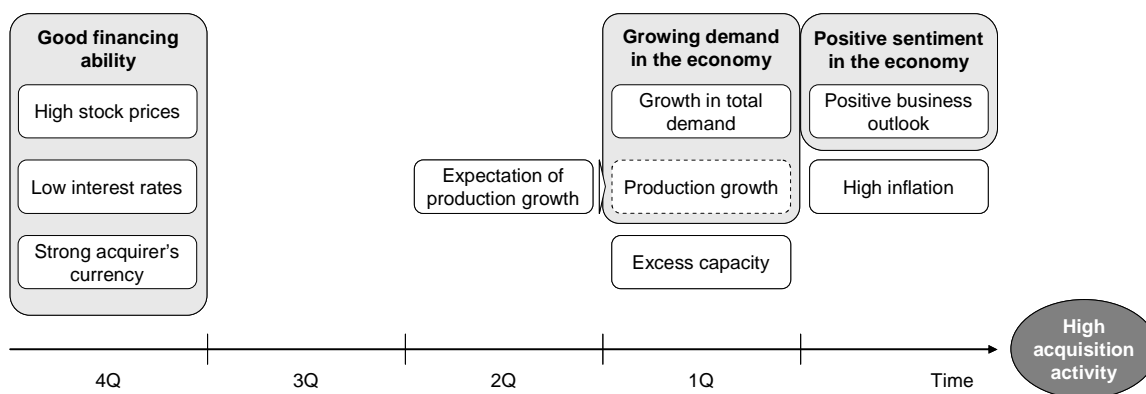


Figure 20: Synthesis of quantitative macro level drivers of acquisition activity

It should be noted that initial considerations of acquisitions and preparatory work take place prior to announcement. Hence, initial acquisition considerations may well begin soon after financing ability has improved. Such considerations may become more serious if further economic preconditions become reality, i.e. if demand and production increase, or if capacity utilization is low. These considerations may be concretized into actual acquisition announcements and completions if overall sentiment is positive in the economy. Acquisition considerations that take place before announcement may also already reflect anticipation of improvement in overall sentiment.

The above discussion can be summarized as follows. When companies begin having an increasing amount of funds available, they take some time to consider how to best utilize their funds. Strategic decisions to pursue acquisitions are followed by an assessment of acquisition candidates, and continuing considerations of whether and when to acquire. If demand and production conditions become favorable, companies are increasingly likely to use the funds for acquisitions. General optimism in the economy and an action-oriented mindset encourage boards and managers to proceed with planned acquisitions. Similarly, announcements may not be made, or initial plans can be cancelled, if the overall business outlook is not sufficiently positive at the planned time of announcement.

An interesting aspect worth noting is that the only variables that are significant in Model 3 are variables reflecting financing ability, that is share prices, interest rates and exchange rates, as well as inflation. As Model 3 only includes cross-currency transactions, it appears logical that demand, production growth, and capacity utilization in an acquirer's economy are less relevant for acquisitions made in other countries. A positive business outlook, in turn, may relate to the expectations of target companies' performance. If targets are in another country, the outlook in the acquirer's country becomes less relevant as a variable.

As indicated by the goodness of fit statistics of the developed models, quantitative macro level drivers explain the majority, around 75%, of the variability in aggregate acquisition activity. The literature review showed that acquisition activity is also affected by micro level, industry level, and qualitative macro level drivers, which are not incorporated in the quantitative models of this study. It is possible, however, that some micro level factors affect acquisition activity indirectly through macro level drivers. For instance, companies' growth plans and managerial overconfidence, which were identified as micro level drivers in the literature review, are positively affected by favorable equity market conditions. Furthermore, while company or industry level factors clearly play an important role as affecting individual acquisitions, these effects inevitably cancel out to a certain extent at the aggregate level. Hence it appears reasonable that acquisition activity, when observed at an aggregate level over time, mostly depends on macro level drivers.

5.2 Assessment of Results

5.2.1 Reliability, Validity and Generalizability

Reliability refers to how well the results of research can be replicated. The results of this study should be very reliable, because (1) most drivers had previously been identified by other researchers, (2) variables were operationalized with objective measures, and (3) the data sources used for the operationalized variables are widely used sources generally acknowledged as reliable in the business and academic communities.

Validity refers to the extent to which a study or variable measures what it is intended to measure. As discussed in Section 3.2, there are several options to operationalize any of the variables used in this study. The selected operationalizations represent very well the

variables in question. Although they are not the only available option, they are among the most representative options.

It is worthwhile to mention interest rates in the context of validity. Interest rates were chosen to represent credit market conditions. This operationalization does not represent the full truth, as it only includes the cost, and not the availability, of credit financing. It is, however, the best available option, and in line with the selection made by other researchers. One can conclude that the models developed in this study are a good approximation of the truth, among several other possible good approximations.

The Finnish acquisition market is well-functioning and ranks at the top of European countries in terms of activity levels when adjusted to each country's size (Ali-Yrkkö, 2002). Therefore the results of the empirical part should be well *generalizable* to other countries with similar economic and regulatory environments, and they should at least partially apply for many other Western economies. However, as Moschieri and Campa (2009) note, significant differences still exist in the rules and patterns of acquisition activity between the United States and Europe, as well as among European countries. Similarly, the results should be generalizable over time, as long as no major changes occur in the economic or regulatory environments.

5.2.2 Further Assessment of Results

Selection of data set

The time scope of the data set ranges from the first quarter of 1992 to the last quarter of 2009, resulting in a total of 72 data points. Optimally, the sample size could have been larger. However, the selection of a time period involves a trade-off between sample size and internal consistency of the data set. Including data from before 1992 would have required the use of different data sources. Earlier data would then likely not have been consistent with data from 1992 onwards. Hence, 1992 can be seen as the starting time point that provides the best possible balance between data consistency and sample size.

The data set does not exclude any transactions based on status. All announced transactions are included, regardless of whether or not they have been completed. This is because macro level drivers of acquisition activity are assumed to affect more the decision to acquire than the actual ability to complete an acquisition. This selection creates, however, a risk of including duplicate transactions. A company may have announced the acquisition of a target but the transaction may eventually not have taken

place. Consequently, the company may have proceeded to acquire another target, one which it would have been unlikely to purchase had the first acquisition been completed. Also, it is possible that the data set includes some transactions which have been announced but later withdrawn because of unfavorable macroeconomic conditions. However, the number of these types of transaction announcements is likely not to be so high that it would alter the results.

Selection of variables

When developing a regression model, there is a trade-off between omitting important variables and including irrelevant variables (Brooks, 2008). It is unlikely that any important variable would have been omitted in this study, as the selection of independent variables was based on a thorough literature assessment. The possible inclusion of a marginally relevant variable is typically considered a lesser problem than the omission of an important variable (Brooks, 2008).

The number of transactions was chosen to represent acquisition activity in this study. Another option would have been to use transaction value, which would have reflected also the order of magnitude of acquisition activity at any point in time. The main reason for using transaction number rather than transaction value was the unavailability of value for a large part of transactions. The problem of missing values could have been fixed by a method such as the one used by Pryor (2001). He assumes, separately for each industry and transaction type, the value of the deals with non-disclosed values to be one sixth of the average value of the deals with disclosed values. However, transaction number rather than transaction value has shown to be a more popular measure of acquisition activity in empirical literature. Also, it has been argued that it provides more reliable results than value (Cook, 2007).

Comprehensiveness of models

This study does not assess the interrelationships between the independent variables, but focuses solely on finding variables that affect acquisition activity. For example, stock and credit market conditions were used as separate explanatory variables, although they are not uncorrelated. Increases in stock prices can lead to increases in interest rates due to an increase in economic activity (Melicher, Ledolter and D'Antonio, 1983). A comprehensive analysis of the relationships between the independent variables of the full models would call for a thorough economic assessment, which lies beyond the

scope of this study. Here, it suffices to note that the independent variables do not exhibit significant multicollinearity.

The three models developed in this study do not explain the full variance in the dependent variable, because they only contain quantitative macro level drivers as independent variables. It should not be omitted that also micro level, industry level, and qualitative macro level factors affect acquisition activity.

Qualitative macro level drivers, as shown in Table 3, could have been included in the models as dummy variables. However, no substantial economy-wide antitrust policies, free trade or privatization actions took place in Finland during the 1990s and the 2000s. Technological developments have been a gradual process rather than an individual event. The main events which could affect acquisition activity during the focal time period were Finland's joining the European Union and the euro in 1995 and in 1999, respectively. Visual inspection of the number of acquisitions, as depicted in Figure 9 and in Appendix 1, reveals no clear peak or step change in acquisition activity in these years.

An increasingly homogenous regulatory framework set by the European Union, as well as the deepening economic integration in the European Union have positively affected acquisition activity (Moschieri and Campa, 2009). These are, however, phenomena that progress little by little, and it is hence difficult to set variables for them.

Lags and causality

The analysis of this study is based on the announcement date, as it is the earliest date which is publicly available. Optimally, an earlier date describing the initiation of negotiations or the initial decision to contemplate entering into an acquisition would have been most appropriate, if available. Hence, the actual lags between macro level drivers and transaction decisions are shorter than the ones shown by the models.

The results of this study show that strong stock market conditions precede acquisition activity by four quarters, suggesting that the direction of causality runs from stock market conditions to acquisition activity. This is in line with several researchers who have found unidirectional causality from stock prices to acquisition activity (e.g. Melicher, Ledolter and D'Antonio, 1983; Clarke and Ioannidis, 1996). These results are, however, not consistent with some other research. Haque, Harnihirun and Shapiro (1995) find bidirectional causality between stock prices and acquisition activity,

whereas Deans (2002) suggests that acquisition activity impacts global stock prices. Determining the direction of causality is not straightforward, as acquisition announcements are preceded by earlier negotiations and thought processes, similarly as changes in stock market conditions are preceded by expectations of those changes.

5.3 Suggestions for Future Research

An abundance of research has been published assessing the effects of any one of the three levels of drivers of acquisition activity. However, literature which would holistically assess the effect of more than one of these categories is scarce (Komlenovic, Mamun and Mishra, 2009). This study begins addressing the gap by incorporating all three levels in a literature based framework, and by quantitatively showing that macro level drivers are the largest contributor to aggregate acquisition activity. The gap could be further addressed by quantitatively assessing the combined effect of micro, industry, and macro level factors on acquisition activity. The research results from such a study could be relevant to both the research community, through filling the identified gap, and to other relevant interested parties who could benefit from the ability to anticipate acquisition activity more accurately.

The research problem of such a comprehensive study could be the same as in this study: *What drives acquisition activity?* The related research questions could be:

1. What micro, industry, and macro level factors affect acquisition activity?
2. How do the identified factors affect acquisition activity?
3. Why do the identified relationships exist?

Although such an all-encompassing research design appears very attractive, in practice it may be difficult to obtain a sufficiently large data set of relevant micro level drivers, as it would require the collection of company specific data for each transaction. A more feasible research design could be one incorporating industry and macro level drivers while excluding company specific factors. One way to do this could be, as suggested by Andrade, Mitchell and Stafford (2001), to analyze macro level drivers while controlling for industry waves, for which Harford (2005) provides a method of identification. Further research aiming at gaining insights into the drivers of acquisition activity could focus on comparing the characteristics of acquisition activity within an industry and across industries.

Literature References

- Ahammad, M., Glaister, K. 2008. Recent trends in UK cross-border mergers and acquisitions. *Management Research News*. 31(2). 86-98.
- Ahern, K., Weston, J. 2007. M&As: The good, the bad and the ugly. *Journal of Applied Finance*. 17(1). 5-20.
- Ali-Yrkkö, J. 2002. Mergers and acquisitions – Reasons and results. *ETLA Discussion Papers*. No. 792.
- Ali-Yrkkö, J., Hyytinen A., Pajarinen, M. 2005. Does patenting increase the probability of being acquired? Evidence from cross-border and domestic acquisitions. *Applied Financial Economics*. 15. 1007–1017.
- Ali-Yrkkö, J. 2006. Technology sourcing through acquisitions – Do high quality patents attract acquirers? *ETLA Discussion Papers*. No. 1025.
- Andersson, T., Svensson, R. 1994. Entry modes for direct investment determined by the composition of firm-specific skills. *Scandinavian Journal of Economics*. 96(4). 551-560.
- Andrade, G., Mitchell, M., Stafford, E. 2001. New evidence and perspectives on mergers. *Journal of Economic Perspectives*. 15(2). 103-120.
- Andrade, G., Stafford, E. 2004. Investigating the economic role of mergers. *Journal of Corporate Finance*. 10. 1-36.
- Bikhchandani, S., Hirshleifer, D., Welch, I. 1998. Learning from the behavior of others: Conformity, fads, and informational cascades. *Journal of Economic Perspectives*. 12(3). 151-170.
- Boschi, M., Girardi, A. 2007. Does one monetary policy fit all? The determinants of inflation in EMU countries. *SSRN Working Paper Series*. February 2007.
- Brealey, R., Myers, S. 2003. *Principles of corporate finance*. McGraw-Hill.
- Brooks, C. 2008. *Introductory econometrics for finance*. Cambridge University Press.
- Campa, J. 2006. Corporate restructuring and M&A activity. *CESifo Forum*. 7(1). 17-21.
- Clarke, R., Ioannidis, C. 1996. On the relationship between aggregate merger activity and the stock market: Some further empirical evidence. *Economic Letters*. 53. 349-356.
- Clougherty, J. 2006. The international drivers of domestic airline mergers in twenty nations: Integrating industrial organization and international business. *Managerial and Decision Economics*. 27. 75-93.

- Cook, S. 2007. On the relationship between mergers and economic activity: Evidence from an optimised hybrid method. *Physica A*. 379. 628-634.
- Daniel, T. 2001. *Management of people in mergers and acquisitions*. Greenwood Publishing Group.
- Deans, G. 2002. *Winning the merger endgame: A playbook for profiting from industry consolidation*. McGraw-Hill.
- Dobson, A. J., Barnett, A. G. 2008. *An introduction to generalized linear models*. Chapman & Hall.
- Dong, M., Hirshleifer, D., Richardson, S., Teoh, S. 2006. Does investor misvaluation drive the takeover market? *The Journal of Finance*. 61(2). 725–762.
- Elder, J., Kennedy, P.E. 2001. Testing for unit roots: What should students be taught? *Journal of Economic Education*. 32(2) 137-146.
- Enders, W. 1995. *Applied econometric time series*. John Wiley & Sons.
- Epstein, M. 2005. The determinants and evaluation of merger success. *Business Horizons*. 48. 37-46.
- Firstbrook, C. 2007. Transnational mergers and acquisitions: How to beat the odds of disaster. *Journal of Business Strategy*. 28(1). 53-56.
- Fontaine, P. 2006. *Europe in 12 lessons*. European Commission.
- Gardiner, K. 2006. The market for mergers and the boundaries of the firm. *CESifo Forum*. 7(1). 9-16.
- Gaughan, P. 2005. *Mergers: What can go wrong and how to prevent it*. John Wiley & Sons.
- Gilbert, C. 1986. Professor Hendry's econometric methodology. *Oxford Bulletin of Econometrics and Statistics*. 48(3). 283-307.
- Golbe, D., White, L. 1993. Catch a wave: The time series behavior of mergers. *The Review of Economics and Statistics*. 75(3). 493-499.
- Granahan, T. M&A drivers taking wrong turn: Recession talk is trouble for deal makers, though mid market still expected to power on. *The Investment Dealers' Digest*. 11 February 2008.
- Guerard, J. 1989. Mergers, stock prices and industrial production: Further evidence. *Economics Letters*. 30(2). 161-164.
- Hanson, J. 1974. *A Dictionary of Economics and Commerce*. Macdonald & Evans Ltd.

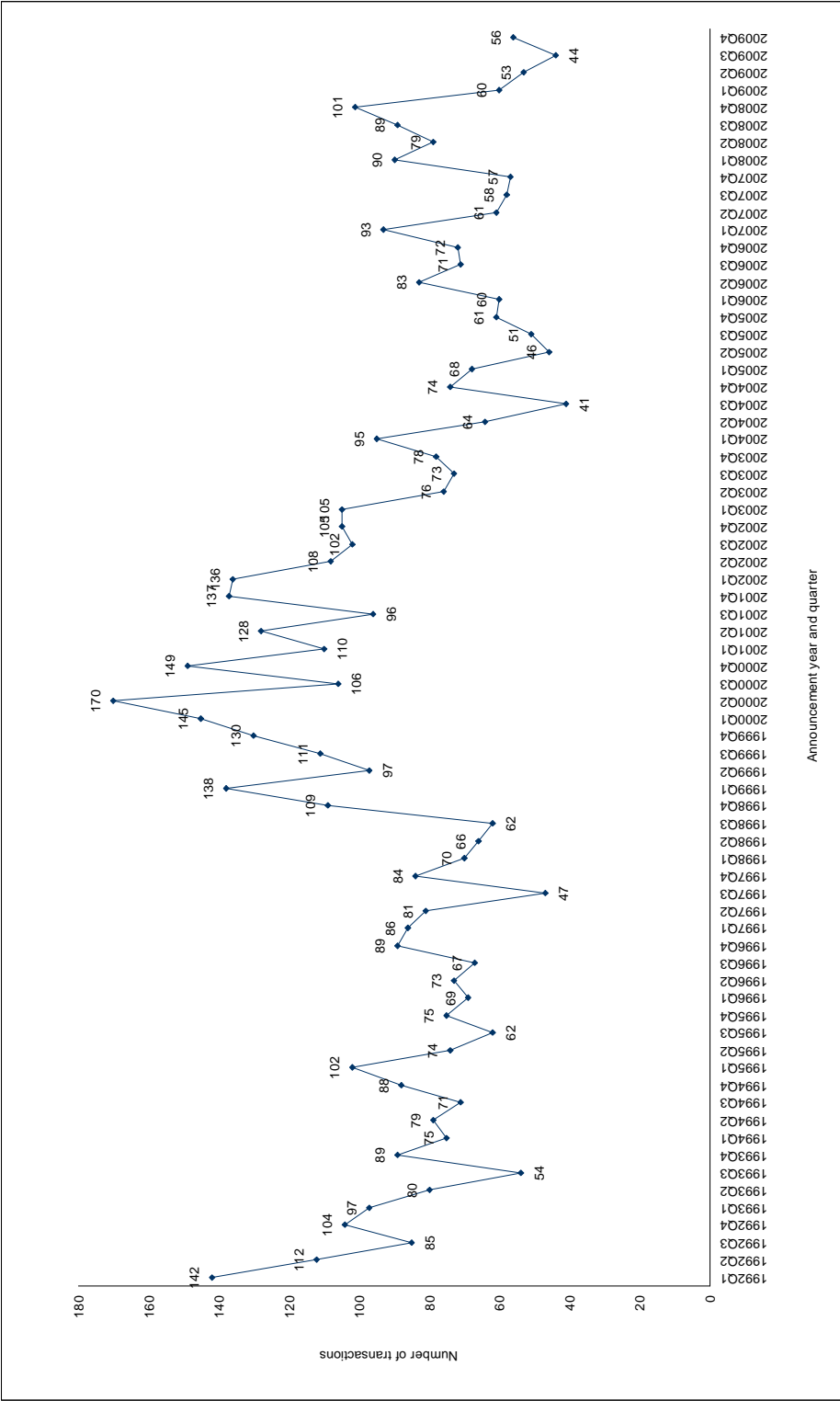
- Haque, M., Harnihirun, S., Shapiro, A. 1995. A time series analysis of causality between aggregate mergers and stock prices: The case of Canada. *Applied Economics*. 27. 563-568.
- Harford, J. 2005. What drives merger waves? *Journal of Financial Economics*. 77. 529-560.
- Hitt, M., Harrison, J., Ireland, R. 2001. *Mergers and acquisitions: A guide to creating value for stakeholders*. Oxford University Press.
- Hitt, M., Ireland, R., Hoskisson, R. 2003. *Strategic management: Competitiveness and globalization*. Thomson South-Western.
- Holmström, B., Kaplan, S. N. 2001. Corporate governance and merger activity in the United States: Making sense of the 1980s and 1990s. *Journal of Economic Perspectives*. 15(2). 121-144.
- Häkkinen, L., Norrman, A., Hilmola, O.-P., Ojala, L. 2004. Logistics integration in horizontal mergers and acquisitions. *The International Journal of Logistics Management*. 15(1). 27-42.
- Iannotta, G. 2010. *Investment banking: A guide to underwriting and advisory services*. Springer Berlin Heidelberg.
- Jensen, M. 1988. Takeovers: Their causes and consequences. *Journal of Economic Perspectives*. 2(1). 21-48.
- Jensen, M. 1993. The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance*. 48(3). 831-880.
- Koedijk, K., Kool, C., Kroes, T. 1994. Changes in world interest rates and inflationary expectations. *Review of World Economics*. 130(4). 712-729.
- Komlenovic, S., Mamun, A., Mishra, D. 2009. Business cycle and aggregate industry mergers. *Journal of Economics and Finance*. Published online 13 August 2009.
- Korhonen, T. 2001. Finnish monetary and foreign exchange policy and the changeover to the euro. *Bank of Finland Discussion Papers*. 25.
- Kwiatkowski, D., Phillips, P., Schmidt, P., Shin, Y. 1992. Testing the null hypothesis of stationarity against the alternative of a unit root. *Journal of Econometrics*. 54. 159-178.
- Lambrecht, B. 2004. The timing and terms of mergers motivated by economies of scale. *Journal of Financial Economics*. 72. 41-62.
- Lehto, E., Lehtoranta, O. 2002. Mergers and acquisitions as a means to transfer technology. *Palkansaaajien tutkimuslaitos, Tutkimuksia* 84.

- Lehto, E., Lehtoranta, O. 2006. How do innovations affect mergers and acquisitions – Evidence from Finland? *Journal of Industry, Competition and Trade*. 6(1). 5-25.
- Lynch, J., Lind, B. 2002. Escaping merger and acquisition madness. *Strategy & Leadership*. 30(2). 5-12.
- Malmendier, U., Tate, G. 2008. Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics*. 89. 20-43.
- Martin, J., Schrum, J. 2007. Private equity: The leveraged buyout model revisited with a dash of clustering. *Problems and Perspectives in Management*. 5(4). 77-84.
- Martínez Torre-Enciso, I., Bilbao García, J. 1996. Mergers and acquisition trends in Europe. *International Advances in Economic Research*. 2(3). 279-286.
- Martynova, M., Renneboog, L. 2008. A century of corporate takeovers: What have we learned and where do we stand? *Journal of Banking & Finance*. 32. 2148-2177.
- Melicher, R., Ledolter, J., D'Antonio, L. 1983. A time series analysis of aggregate merger activity. *The Review of Economics and Statistics*. 65(3). 423-430.
- Mitchell, M., Mulherin, H. 1996. The impact of industry shocks on takeover and restructuring activity. *Journal of Financial Economics*. 41. 193-229.
- Montgomery, D. C., Peck, E. A. 1992. *Introduction to linear regression analysis*. John Wiley & Sons.
- Moschieri, C., Campa, J. 2009. The European M&A industry: A market in the process of construction. *Academy of Management Perspectives*. November. 71-87.
- Mueller, D. 1989. Mergers: Causes, effects and policies. *International Journal of Industrial Organization*. 7. 1-10.
- Nelson, R. 1959. Merger movements in American industry, 1895-1954. *Princeton University Press*. Princeton.
- OECD. 2001. Merging markets. *The OECD Observer*. 228. 57.
- Powell, R., Yawson, A. 2005. Industry aspects of takeovers and divestitures: Evidence from the UK. *Journal of Banking & Finance*. 29. 3015-3040.
- Pryor, F. 2001. Dimensions of the worldwide merger boom. *Journal of Economic Issues*. 35(4). 825-840.
- Raghavan, A. Deals & deal makers: American companies look to Europe for acquisitions. *The Wall Street Journal*. 30 June 2003.
- Rhodes-Kropf, M., Viswanathan, S. 2004. Market valuation and merger waves. *The Journal of Finance*. 59(6). 2685-2718.

- Roll, R. 1986. The hubris hypothesis of corporate takeovers. *Journal of Business*. 59(2). 197-216.
- Scherer, F. 2006. A new retrospective on mergers. *Review of Industrial Organization*. 28. 327-341.
- Schwert, G. 2000. Hostility in takeovers: In the eyes of the beholder? *The Journal of Finance*. 55(6). 2599-2640.
- Sherman, A. 2005. *Mergers and Acquisitions from A to Z*. AMACOM.
- Sherman, A., Badillo, A. 2010. Is the M&A market back? *Wiley Periodicals*. DOI 10.1002.
- Shleifer, A., Vishny, R. 2003. Stock market driven acquisitions. *Journal of Financial Economics*. 70. 295-311.
- Shivdasani, A., Wang, Y. 2011. Did structured credit fuel the LBO boom? *The Journal of Finance*. Forthcoming.
- Sveriges Riksbank. 1999. Determinants of inflation. *Quarterly Review - Sveriges Riksbank*. December 1999.
- Town, R. 1992. Merger Waves and the Structure of Merger and Acquisition Time-Series. *Journal of Applied Econometrics*. 7. S83-S100.
- Verbeek, M. 2008. *A guide to modern econometrics*. John Wiley & Sons.
- Weston, J. 2001. *Mergers and acquisitions*. McGraw-Hill.
- Wood, A. 2009. Capacity rationalization and exit strategies. *Strategic Management Journal*. 30. 25-44.

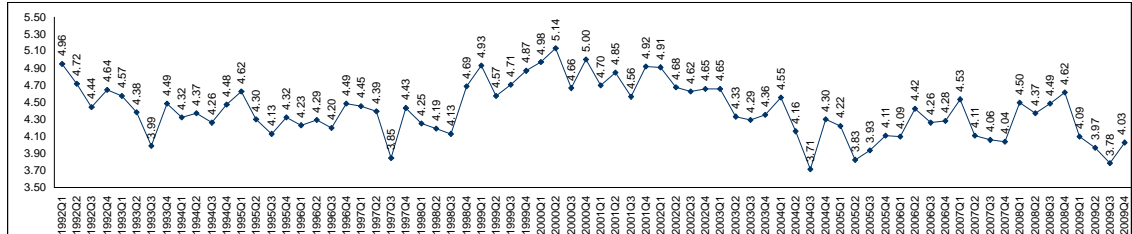
Appendix 1: Number of Transactions in Each Quarter

The figure below displays the number of transactions that were announced in each quarter during the focal time period.

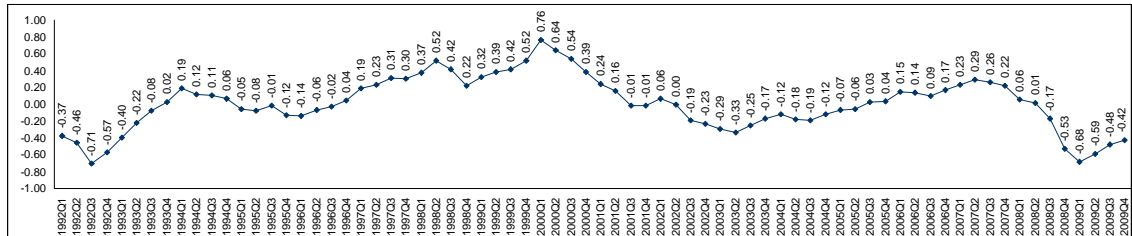


Appendix 2: Charts of Variables Plotted over Time

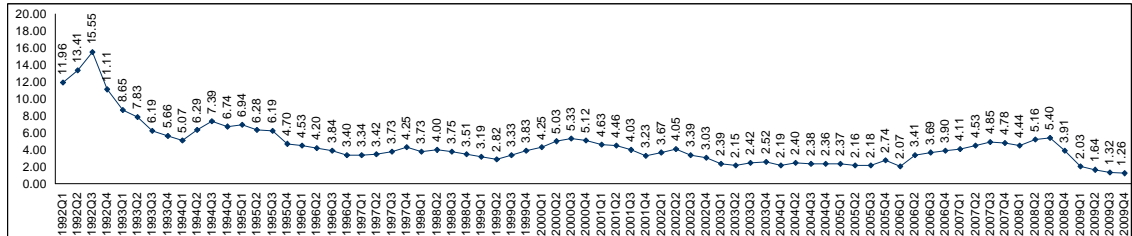
The figures below present the dependent variable and each independent variable plotted over time.



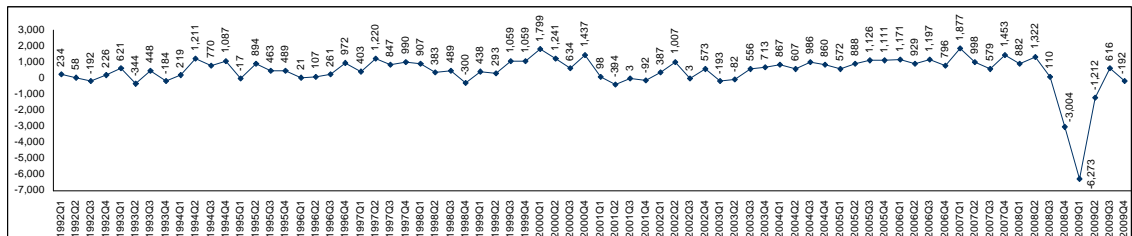
Natural logarithm of the number of transactions



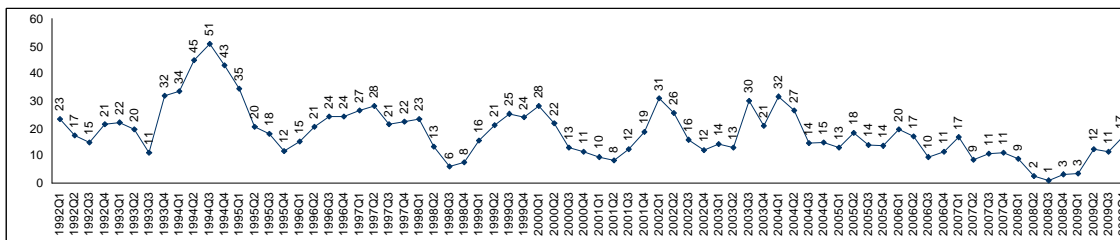
Difference between natural logarithm of stock index and its trendline



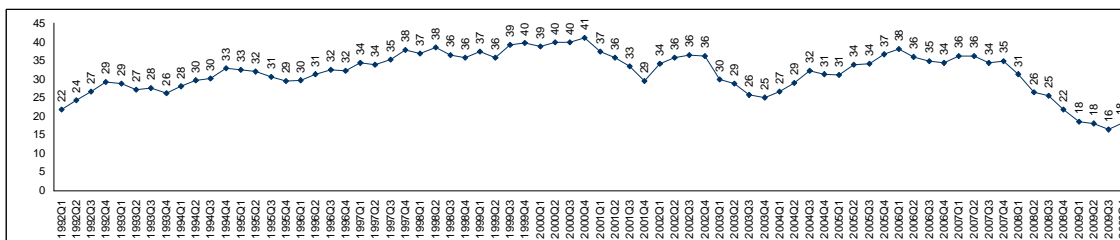
Twelve-month interbank interest rates



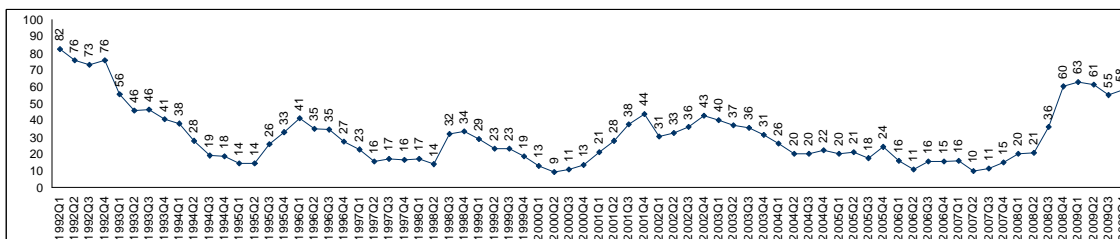
First difference of seasonally smoothed total demand



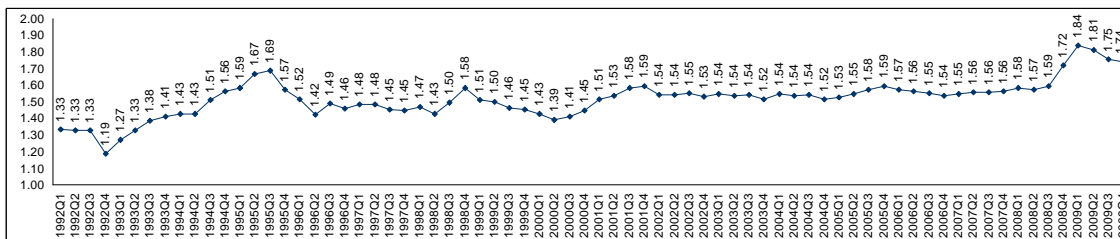
Percentage of respondents stating that they expect the business outlook to improve



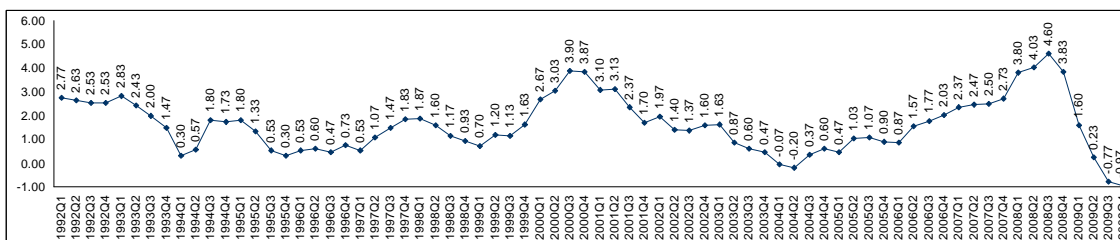
Backward-looking four-quarter moving average of the percentage of respondents stating that they expect production to increase in the next three months



Percentage of respondents stating that they have excess capacity



Finnish mark to Swedish crown exchange rate



Inflation